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ABSTRACT

Presented is information useful to applicants who are preparing for the Airline Transport Pilot-Airplane (Air Carrier) Written Test. The guide describes the basic aeronautical knowledge and associated requirements for certification, as well as information on source material, instructions for taking the official test, and questions that are representative of the test. (Author/JN)

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AC 61-87

AIRLINE TRANSPORT PILOT - AIRPLANE

(AIR CARRIER)

ED195404

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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WRITTEN TEST GUIDE

SE 033 252

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

AIRLINE TRANSPORT PILOT-AIRPLANE (AIR CARRIER) WRITTEN TEST GUIDE

1979

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FLIGHT STANDARDS SERVICE

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PREFACE

This written test guide has been prepared by the Federal Aviation Administration to assist applicants who are preparing for the Airline Transport Pilot-Airplane (Air Carrier) Written Test. It supersedes AC 61-18E, Airline Transport Pilot-Airplane Written Test Guide, dated 1977.

This guide briefly explains the need for comprehensive instruction and describes the basic aeronautical knowledge and associated requirements for certification. Information on source material that may be used to acquire essential knowledge in the various subject areas is also included. Further, it provides the instructions for taking the official test as well as the questions representative of those from which the FAA makes selections in composing that test. The questions given in this guide are predicated on regulations, principles, and practices that were valid at the time of publication. Consequently, the questions in the official test, whenever updated, may vary somewhat from those contained in this guide.

Since the written test places major emphasis on requirements relating to airline operations, all pilots taking it should expect to be examined on that basis.

Comments regarding this publication should be directed to the Department of Transportation, Federal Aviation Administration, Flight Standards National Field Office, P. O. Box 25082, Oklahoma City, Oklahoma 73125.

JAMES M. VINES
Acting Director
Flight Standards Service

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AIRLINE TRANSPORT PILOT-AIRPLANE (AIR CARRIER) WRITTEN TEST GUIDE

INTRODUCTION

The Federal Aviation Administration has adopted the "question book" concept for use in determining an applicant's aeronautical knowledge.

At the testing center, the applicant is issued a question book containing over nine hundred questions, an eighty-item question selection sheet which indicates the specific questions to be answered, and an Airman Written Test Application (AC Form 8080-3) which contains the answer sheet. The question book includes all the supplementary material required to answer the test questions. Supplementary material, such as a performance chart, will normally be found within one page of the question with which it is associated. Where this is not practicable, page reference numbers will be given. Chart legends and other pertinent reference materials are contained in the Appendix of the question book.

This guide includes questions which are representative of those in the question book. The Subject Matter Outline (SMO) reference code for each question appears directly below each question number. This SMO code, and the Subject Matter Outline, which appears on page 7, will enable the applicant to readily identify the reference upon which each question is based. A sample 80-item question selection sheet is included in the Appendix, along with an example of the answer sheet used by the applicant for the official test.

It should be emphasized that a written test merely *samples* an applicant's knowledge in a particular area. The objective of Section 61.153 is to ensure that the applicant has the knowledge required for competent performance as an Airline Transport Pilot in airplanes. A careful study of *all* the questions contained in this guide along with the *associated reference material* will give the applicant this broad knowledge base.

ELIGIBILITY REQUIREMENTS FOR CERTIFICATE

The following excerpts from the Federal Aviation Regulations, Part 61, pertaining to eligibility, are given for the convenience of the applicant.

"§61.151 Eligibility requirements: general.

To be eligible for an airline transport pilot certificate, a person must--

(a) Be at least 23 years of age;

(b) Be of good moral character;

(c) Be able to read, write, and understand the English language and speak it without accent or impediment of speech that would interfere with two-way radio conversation;

(d) Be a high school graduate, or its equivalent in the Administrator's opinion, based on the applicant's general experience and aeronautical experience, knowledge, and skill;

(e) Have a first-class medical certificate issued under Part 67 of this chapter within the 6 months before the date he applies; and

(f) Comply with the sections of this Part that apply to the rating he seeks."

"§61.153 Airplane rating: aeronautical knowledge.

An applicant for an airline transport pilot certificate with an airplane rating must, after meeting the requirements of §[61.151] (except paragraph (a) thereof) and [61.155], pass a written test on--

(a) The sections of this Part relating to airline transport pilots and Part 121, subpart C of Part 65, and §§91.1 through 91.9 and subpart B of Part 91 of this chapter, and so much of Parts 21 and 25 of this chapter as relate to the operations of air carrier aircraft;

(b) The fundamentals of air navigation and use of formulas, instruments, and other navigational

aids, both in aircraft and on the ground, that are necessary for navigating aircraft by instruments;

(c) The general system of weather collection and dissemination;

(d) Weather maps, weather forecasting, and weather sequence abbreviations, symbols, and nomenclature;

(e) Elementary meteorology, including knowledge of cyclones as associated with fronts;

(f) Cloud forms;

(g) National Weather Service Federal Meteorological Handbook No. 1, as amended;

(h) Weather conditions, including icing conditions and upper-air winds, that affect aeronautical activities;

(i) Air navigation facilities used on Federal airways, including rotating beacons, course lights, radio ranges, and radio marker beacons;

(j) Information from airplane weather observations and meteorological data reported from observations made by pilots on air carrier flights;

(k) The influence of terrain on meteorological conditions and developments, and their relation to air carrier flight operations;

(l) Radio communication procedure in aircraft operations; and

(m) Basic principles of loading and weight distribution and their effect on flight characteristics."

"[1]61.155 Airplane rating: aeronautical experience.

(a) An applicant for an airline transport pilot certificate with an airplane rating must hold a commercial pilot certificate or a foreign airline transport pilot or commercial pilot license without limitations, issued by a member state of ICAO, or he must be a pilot in an Armed Force of the United States whose military experience qualifies him for a commercial pilot certificate under [1][61.73] of this Part.

(b) An applicant must have had–

(1) At least 250 hours of flight time as pilot in command of an airplane, or as copilot of an airplane performing the duties and functions of a pilot in command under the supervision of a pilot in command, or any combination thereof, at least 100 hours of which were cross-country time and 25 hours of which were night flight time; and

(2) At least 1500 hours of flight time as a pilot, including at least–

(i) 500 hours of cross-country flight time;

(ii) 100 hours of night flight time; and

(iii) 75 hours of actual or simulated instrument time, at least 50 hours of which were in actual flight.

Flight time used to meet the requirements of subparagraph (1) of this paragraph may also be used to meet the requirements of subparagraph (2) of this paragraph. Also, an applicant who has made at least 20 night takeoffs and landings to a full stop may substitute one additional night takeoff and landing to a full stop for each hour of night flight time required by subparagraph (2)(ii) of this paragraph. However, not more than 25 hours of night flight time may be credited in this manner.

(c) If an applicant with less than 150 hours of pilot in command time otherwise meets the requirements of paragraph (b)(1) of this section, his certificate will be endorsed "Holder does not meet the pilot in command flight experience requirements of ICAO," as prescribed by Article 39 of the "Convention on International Civil Aviation." Whenever he presents satisfactory written evidence that he has accumulated the 150 hours of pilot in command time, he is entitled to a new certificate without the endorsement.

(d) A commercial pilot may credit toward the 1500 hours total flight time requirement of subparagraph (b)(2) of this section the following flight time in operations conducted under Part 121 of this chapter:

(1) All second in command time acquired in airplanes required to have more than one pilot by their approved Aircraft Flight Manuals or airworthiness certificates; and

(2) Flight engineer time acquired in airplanes required to have a flight engineer by their approved Aircraft Flight Manuals, while participating at the same time in an approved pilot training program approved under Part 121 of this chapter.

However, the applicant may not credit under subparagraph (2) of this paragraph more than 1 hour for each 3 hours of flight engineer flight time so acquired, nor more than a total of 500 hours.

(e) If an applicant who credits second in command or flight engineer time under paragraph (d) of this section toward the 1500 hours

total flight time requirement of subparagraph (b)(2) of this section–

(1) Does not have at least 1200 hours of flight time as a pilot including no more than 50 percent of his second in command time and none of his flight engineer time; but

(2) Otherwise meets the requirements of subparagraph (b)(2) of this section,

his certificate will be endorsed "Holder does not meet the pilot flight experience requirements of ICAO," as prescribed by Article 39 of the "Convention on International Civil Aviation." Whenever he presents satisfactory evidence that he has accumulated 1200 hours of flight time as a pilot including no more than 50 percent of his second in command time and none of his flight engineer time, he is entitled to a new certificate without the endorsement."

[(f) [Reserved]]

THE WRITTEN TEST

Questions and Scoring

The official test questions are of the multiple-choice type. Answers to questions listed on the question selection sheet should be marked on the answer sheet of the Airman Written Application (AC Form 8080-3). Directions should be read carefully before beginning the test. Incomplete or erroneous personal information entered on this form delays the scoring process.

The answer sheet is sent to the Mike Monroney Aeronautical Center in Oklahoma City where it is scored by a computer to indicate by code, the knowledge areas in which the applicant is found to be deficient. A written test Subject Matter Outline, which lists these knowledge areas by code, is enclosed with the Airman Written Test Report (AC 8080-2). The applicant must present this report for a flight test, or for retesting in the event of written test failure.

Taking the Test

The written test may be taken at FAA Flight Standards District Offices and other designated places. After completing the test, the applicant must surrender the question book, question selection sheet, answer sheet, and any papers used for computations or notations, to the proctor before leaving the test room.

When taking the test, the applicant should keep the following points in mind:

1. Answer each question in accordance with the latest regulations and procedures.
2. Read each question carefully before looking at the possible answers. You should clearly understand the problem before attempting to solve it.
3. After formulating an answer, determine which of the alternatives most nearly corresponds with that answer. The answer chosen should completely resolve the problem.
4. From the answers given, it may appear that there is more than one possible answer; however, there is only one answer that is correct and complete. The other answers are either incomplete or are derived from popular misconceptions.
5. If a certain question is difficult for you, it is best to proceed to other questions. After the less difficult questions have been answered, return to those which gave you difficulty. Be sure to indicate on the question selection sheet the questions to which you wish to return.
6. When solving a computer problem, select the answer nearest your solution. The problem has been checked with various types of computers; therefore, if you have solved it correctly, your answer will be closer to the correct answer than to any of the other choices.
7. Enter personal data in appropriate spaces on the test answer sheet in a complete and legible manner to aid in scoring. The test number is printed on the question selection sheet. It is *not the number* on the question book.

Retesting–FAR 61.49

Applicants who receive a failing grade, may apply for retesting by presenting their Airman Written Test Report, AC Form 8080-2–

(1) after 30 days from the date the applicant failed the test; or,

(2) in case of the first failure, the applicant may apply for retesting before the 30 days

have expired upon presenting a written statement from an authorized instructor certifying that the instructor has given ground instruction to the applicant and finds the applicant competent to pass the test.

STUDY MATERIALS

Individuals preparing for the Airline Transport Pilot-Airplane (Air-Carrier) Written Test will find the following list of publications and materials helpful. Textbooks and other reference materials are available from many commercial publishers. It is the responsibility of each applicant to obtain appropriate study materials.

These publications identified as "(Sup't. Doc's.)" are for sale from:

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

or from GPO bookstores located in major cities throughout the United States. Those publications identified as "(Free from FAA)" may be obtained from:

U. S. Department of Transportation
Publications Section, M-443.1
Washington, D. C. 20590

The Advisory Circular Checklist, AC 00-2, is also available free of charge from the above address. The Checklist contains complete titles and ordering instructions for both free and for sale FAA advisory circulars.

AIRMAN'S INFORMATION MANUAL (AIM) -- Issued semiannually (Sup't. Doc's.)

This publication presents information necessary for the planning and conduct of flight in the U.S. National Airspace System. This manual is complimented by other operational publications which are available upon separate subscription. These publications are:

Graphic Notices and Operational Data -- Issued quarterly (Sup't. Doc's.)

Notices to Airmen (Class-II) -- Issued every 14 days. (Sup't. Doc's.)

Airport/Facility Directory -- Issued every 8 weeks (National Ocean Survey, NOAA, Department of Commerce.)

FEDERAL AVIATION REGULATIONS (FARs) (Sup't. Doc's.)

Part 1, Definitions and Abbreviations

Part 61, Certification: Pilots and Flight Instructors

Part 65, Certification: Airmen Other than Flight Crewmembers

Part 91, General Operating and Flight Rules

Part 121, Certification and Operations: Domestic, Flag, and Supplemental Air Carriers and Commercial Operators of Large Aircraft

ADVISORY CIRCULARS

00-6A-*Aviation Weather*
Provides an up-to-date and expanded text for pilots and other flight operations personnel whose interest in meteorology is primarily in its application to flying. (Sup't. Doc's.)

00-24-*Thunderstorms*
Contains information concerning flights in or near thunderstorms. (Free from FAA)

00-30-*Rules of Thumb for Avoiding or Minimizing Encounters with Clear Air Turbulence*
Brings to the attention of pilots and other interested personnel, the "Rule of Thumb" for avoiding or minimizing encounters with clear air turbulence (CAT). (Free from FAA)

00-45A-*Aviation Weather Services*
Supplements AC 00-6A, Aviation Weather, in that it explains the weather service in general and the use and interpretation of reports, forecasts, weather maps, and prognostic charts in detail. Is an excellent source of study for pilot certification examinations. (Sup't. Doc's.)

00-50-*Low Level Wind Shear*
Provides guidance for recognizing the meteorological situations that produce the phenomenon widely known as low level wind shear. (Free from FAA)

20--32B--*Carbon Monoxide (CO) Contamination in Aircraft—Detection and Prevention*

Provides information on the potential dangers of carbon monoxide contamination from faulty engine exhaust systems or cabin heaters of the exhaust gas heat exchanger type. (Free from FAA)

60--4--*Pilot's Spatial Disorientation*

Acquaints pilots flying under visual flight rules with the hazards of disorientation caused by the loss of reference with the natural horizon. (Free from FAA)

61--27B--*Instrument Flying Handbook*

Provides the pilot with basic information needed to acquire an FAA instrument rating. It is designed for the reader who holds at least a private pilot certificate and is knowledgeable in all areas covered in the "Pilot's Handbook of Aeronautical Knowledge." (Sup't. Doc's.)

61--77--*Airline Transport Pilot Airplane Practical Test Guide*

Designed to assist the applicant and his instructor in preparing for the Airline Transport Pilot Certificate with an Airplane Rating under FAR Part 61 (revised). (Sup't. Doc's.)

90--1A--*Civil Use of U.S. Government Produced Instrument Approach Charts*

Clarifies landing minimums requirements and revises instrument approach charts. (Free from FAA)

90--23D--*Wake Turbulence*

Alerts pilots to the hazards of aircraft trailing vortex wake turbulence and recommends related operational procedures. (Free from FAA)

90-62--*Flying DME Arcs*

Describes the procedures and techniques for intercepting DME arcs from radials, maintaining DME arcs, and intercepting radials and localizers from DME arcs. (Free from FAA)

90-64 *Automated Radar Terminal System (ARTS) III*

Advises the aviation community of the capabilities of the Automated Radar Terminal System and the associated services provided by ARTS III equipped air traffic control facilities. (Free from FAA)

91--6A--*Water, Slush, and Snow on the Runway*

Provides background and guidelines concerning the operation of turbojet aircraft with water, slush, and/or snow on the runway. (Free from FAA)

91.11--1--*Guide to Drug Hazards in Aviation Medicine*

Lists all commonly used drugs by pharmacological effect on airmen with side effects and recommendations. (Sup't. Doc's.)

91--23A--*Pilot's Weight and Balance Handbook*

Provides an easily understood text on aircraft weight and balance for pilots who need to appreciate the importance of weight and balance control for safety of flight. Progresses from an explanation of basic fundamentals to the complete application of weight and balance principles in large aircraft operations. (Sup't. Doc's.)

91--24--*Aircraft Hydroplaning or Aquaplaning on Wet Runways*

Provides information on the problem of aircraft tires hydroplaning on wet runways. (Free from FAA)

91--25A--*Loss of Visual Cues During Low Visibility Landings*

Provides information concerning the importance of maintaining adequate visual cues during the descent below MDA or DA. (Free from FAA)

91--43--*Unreliable Airspeed Indications*

Alerts pilots to the possibility of erroneous airspeed/Mach indications that may be caused by blocking or freezing of the pitot system and advises of corrective action that can be taken. (Free from FAA)

95--1--*Airway and Route Obstruction Clearance*

Advises all interested persons of the airspace areas within which obstruction clearance is considered in the establishment of Minimum En Route Instrument Altitudes (MEA's) for publication in FAR Part 95. (Free from FAA)

120–5–*High Altitude Operations in Areas of Turbulence*

Recommends procedures for use by jet pilots when penetrating areas of severe turbulence. (Free from FAA)

120–28B–*Criteria for Approval of Category IIIa Landing Weather Minima*

States an acceptable means, not the only means, for obtaining approval of Category IIIa minima and the installation approval of the associated airborne systems. (Free from FAA)

120–29–*Criteria for Approving Category I and Category II Landing Minima for FAR 121 Operators*

Sets forth criteria used by FAA in approving turbojet landing minima of less than 300-3/4 or RVR 4,000 (Category I) and Category II minima for all aircraft. (Free from FAA)

121–12–*Wet or Slippery Runways*

Provides uniform guidelines in the application of the "wet runway" rule by certificate holders operating under FAR 121. (Free from FAA)

121–18–*Aviation Security—Carriage of Weapons and Escorted Persons*

Provides information and guidance for the implementation of amendments to FAR Part 121 regarding the carriage of weapons on aircraft and for the carriage of persons in the custody of law enforcement officers. (Free from FAA)

121.195(d)–1–*Alternate Operational Landing Distances for Wet Runways; Turbojet Powered Transport Category Airplanes*

Sets forth an acceptable means, but not the only means, by which the alternate provision of section 121.195(d) may be met. (Free from FAA)

AERONAUTICAL KNOWLEDGE COVERED BY THE WRITTEN TEST

To determine the knowledge areas in which you experienced difficulty, compare the subject matter codes on the enclosed Airman Written Test Report, AC Form 8080-2, with the coded items on the subject matter outline below. The total number of test items you missed cannot be determined by the number of subject matter codes shown on AC Form 8080-2, since you may have missed more than one question in each subject matter code identified.

NOTE: FAR Parts 1, 61, 65, 91 and 121 are codified under Subchapter D, Airmen, of Title 14 of the Code of Federal Regulations.

FAR PART 1: DEFINITIONS AND ABBREVIATIONS

- A10 General definitions (1.1)
- A20 Abbreviations; symbols (1.2)

FAR PART 61: CERTIFICATION: PILOTS AND FLIGHT INSTRUCTORS

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  - B11 CAT II pilot authorization (61.21)
  - B12 medical certificates (61.23)
- B13 Pilot logbooks: logging flight time (61.51)
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Subpart B – Aircraft Ratings and Special Certificates

- B20 Category II pilot authorization (61.67)

Subpart F – Airline Transport Pilots

- B30 Eligibility (61.151)
- B31 Airplane rating: aeronautical
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- B32 Instruction in air transportation service (61.169)
- B33 General privileges; limitations (61.171)

FAR PART 65: CERTIFICATION: AIRMAN OTHER THAN FLIGHT CREWMEMBERS

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- D11 Preflight action (91.5)
- D12 Category II operation; general operating rules (91.6)
- D13 Flight crewmembers at stations (91.7)
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- D15 Fuel requirements: IFR conditions (91.23)
- D16 ATC transponder equipment (91.24)
- D17 VOR equipment check (IFR) (91.25)
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- D21 ATC clearances; instructions (91.75)
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- D23 Flight plan; information required (91.83)
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- D42 Limitations on use of IAP (91.117)
- D43 Minimum altitudes (IFR) (91.119)
- D44 Cruising altitudes or flight levels (IFR) (91.121)
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- D47 Operation in controlled airspace (IFR) malfunction reports (91.129)

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- D51 Instruments; equipment approval (App. A, 3)
- D52 Maintenance program (App. A, 4)

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  - E11 takeoff limitations (121.177)
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- Radio equipment
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- E43 Airborne weather radar equipment requirements (121.357)
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  - F38 supplemental; commercial (121.445)
- F39 Pilot; route; airport qualifications for particular trips: domestic; flag (121.447)

Subpart P – Aircraft Dispatcher Qualifications and Duty Time Limitations: Domestic and Flag Air Carriers

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Z12 Preferred routes
Z13 Area navigation
Z14 DME Arc
Z15 Instrument interpretation; indications
Z16 Hydroplaning
Z17 Aircraft performance–factors affecting
Z18 Mach, mach number, critical mach
Z19 Unusual attitude recovery

STUDY MATERIALS

The following materials may be obtained from:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

AC 61-87 Airline Transport Pilot (Airplane)–Air Carrier Written Test Guide
AC 65-4B Aircraft Dispatcher Written Test Guide
AC 00-6A Aviation Weather
AC 00-45A Aviation Weather Services
AC 91-23A Pilot's Weight and Balance Handbook
AC 61-27B Instrument Flying Handbook
AC 91.11-1 Guide to Drug Hazards in Aviation Medicine

Airman's Information Manual
Airport/Facility Directory
Federal Aviation Regulations, Parts 1,61, 65, 91, and 121

The following Advisory Circulars may be obtained free from:

U.S. Department of Transportation
Publications Section, TAD-443.1
Washington, D.C. 20590

AC 00-24 Thunderstorms
AC 00-30 Rules of Thumb for Avoiding or Minimizing Encounters with Clear Air Turbulence
AC 00-50 Low Level Wind Shear
AC 20-32B Carbon Monoxide (CO) Contamination in Aircraft – Detection and Prevention
AC 60-4 Pilot's Spatial Disorientation
AC 90-1A Civil Use of U.S. Government Produced Instrument Approach Charts (90-1A is included in the Instrument Flying Handbook)
AC 90-23D Wake Turbulence
AC 90-62 Flying DME Arcs
AC 90-64 Automated Radar Terminal System (ARTS) III
AC 91-6A Water, Slush, and Snow on the Runway
AC 91-24 Aircraft Hydroplaning or Aquaplaning on Wet Runways
AC 91-25A Loss of Visual Cues During Low Visibility Landings
AC 91-43 Unreliable Airspeed Indications
AC 95-1 Airway and Route Obstruction Clearance
AC 120-3 High Altitude Operations in Areas of Turbulence
AC 120-28B Criteria for Approval of Category IIIa Landing Weather Minima
AC 120-29 Criteria for Approving Category I and Category II Landing Minima for FAR Part 121 Operators
AC 121-12 Wet or Slippery Runways
AC 121-18 Aviation Security–Carriage of Weapons and Escorted Persons
AC 121-195 (d)-1 Alternate Operational Landing Distances for Wet Runways; Turbojet Powered Transport Category Airplanes

APPENDIX 1

TEST QUESTIONS

001. V_{S1} is defined as the stalling speed or minimum steady flight speed
A20

1- obtained in a specified configuration.
2- at which the airplane is controllable.
3- in the landing configuration.
4- with the critical engine inoperative.

002. If an emergency requiring immediate action causes you to deviate from a
D10 rule in FAR Part 91, what is your responsibility as pilot in command?

1- A written report of the deviation must be submitted within 7 calendar days to the Administrator.
2- No report is necessary unless priority handling by ATC was required.
3- A written report shall be made immediately to the nearest Air Carrier District Office upon landing at destination.
4- A written report of the deviation shall be submitted only if requested by the Administrator.

003. When an air carrier airplane is to be dispatched to an airport forecast to
E18 have a wet or slippery runway at the ETA, which performance factor is required?

1- Extra fuel must be loaded to allow return to the departure airport in the event runway conditions do not improve.
2- Effective runway length must be calculated at 60% of the actual runway available.
3- Extra fuel must be loaded to allow holding until the runway contamination has been cleared.
4- Effective runway available must be 115% of that required for landing on a dry runway.

004. A four-engine turbine powered domestic air carrier airplane must be ferried to
D18 another base for repair of an inoperative engine. What operational requirement must be observed?

1- Only the required flight crewmembers may be on board the airplane.
2- The takeoff gross weight must not exceed 65% of the maximum certificated gross takeoff weight.
3- The computed takeoff distance to reach V_1 must not exceed 70% of the available runway determined with all engines operating.
4- The existing and forecast weather for departure, en route, and landing must be VFR.

005. FAR Part 1 defines V_{SO} as the stalling speed or minimum steady flight speed
A20

1- at which the airplane is controllable.
2- obtained in a specified configuration.
3- with the critical engine inoperative.
4- in the landing configuration.

006. FAR Part 1 defines V_1 as the

A20 1- takeoff safety speed.
2- speed at which the airplane is controllable.
3- takeoff decision speed.
4- critical engine failure speed.

007. A pilot may not serve as pilot in command during a CAT II instrument
B11 approach operation unless certain experience requirements have been met regarding the make and basic model flight control guidance system used in that operation. This required recent experience includes

1- three ILS approaches within the preceding 3 months.
2- six ILS approaches within the preceding 6 months.
3- six ILS approaches within the preceding 3 months.
4- three ILS approaches within the preceding 6 months.

008. Unless otherwise required by the applicable distance from cloud criteria, and
D24 until further descent is required for a safe landing, a pilot of a turbine-powered airplane shall maintain which altitude within an airport traffic area?

1- 700 feet
2- 1,200 feet
3- 1,500 feet
4- 2,000 feet

009. The maximum altitude loss for a malfunctioning automatic pilot with an
H29 approach coupler for your airplane is 45 feet. The reported weather conditions for a particular airport are less than basic VFR minimums. To what minimum altitude can the automatic pilot be used for an ILS approach to a landing?

1- 30 feet AGL
2- 50 feet AGL
3- 95 feet AGL
4- 105 feet AGL

010. An airport may not be listed as an alternate in the dispatch release
I24 unless the weather reports or forecasts indicate that the weather conditions will be at or above the alternate minimums

1- specified in the certificate holder's operations specification for that airport, when the flight arrives.
2- listed on the approach charts of that airport, from 2 hours before to 2 hours after the ETA for that flight.
3- specified in the certificate holder's operations specification for that airport, from 1 hour before to 1 hour after the ETA for that flight.
4- listed on the approach charts of that airport, at the time the flight is expected to arrive.

011. A passenger-carrying landplane is certificated with an escape slide
E32 which deploys automatically. When must the system be armed?

1- All phases of flight and ground operations.
2- Takeoff and landing only.
3- Taxi, takeoff, and landing.
4- Anytime an emergency condition exists.

012. Transport category airplanes (except C-46 type airplanes), operated in the
E43 conterminous United States, must have airborne weather radar equipment installed

1- only if the airplane is jet powered and used in passenger operations.
2- regardless of the airplane size, powerplants, and certificated gross weight.
3- and the alternate source of electrical power for the weather radar operational.
4- only if the airplane's maximum takeoff weight is over 50,000 pounds and it is used in passenger operations.

013. What flight time limitations are established for flight deck crewmembers for
G10 FAR Part 121 operations?

1- All commercial flying in any flight crewmember position.
2- Any commercial flying in any flight crewmember position conducted under FAR Part 121 operations.
3- Only that flight time in FAR Part 121 operations.
4- All flight time in any flight crewmember position.

014. The maximum altitude loss for a malfunctioning automatic pilot with an approach
H29 coupler is 20 feet. The reported weather is below basic VFR minimums and you are making an ILS approach using an approach coupler. What is the minimum altitude to which the autopilot may be used?

1- 150 feet AGL
2- 90 feet AGL
3- 70 feet AGL
4- 40 feet AGL

015. Which speed restrictions should you observe upon arriving at Los Angeles
D20 International Airport (TCA) in a turbine-engine powered airplane?

	Within Airport Traffic Area	Below 10,000 feet	Within TCA
1-	230 knots	250 knots	200 knots
2-	250 knots	250 knots	250 knots
3-	180 knots	230 knots	230 knots
4-	156 knots	230 knots	230 knots

016. A passenger-carrying landplane is certificated with the automatic deploying
E32 escape slide system. During which operations must this system be armed?

1- During taxi, takeoff, and landing.
2- Only for takeoff and landing.
3- Only for taxi and takeoff.
4- Anytime an emergency condition exists which would require system deployment.

017. What requirement must be met regarding cargo that is carried aft of the fore-
E19 most seated passengers in an air carrier airplane?

1- The cargo may be carried in an open bin if the bin is of a non-toxic or non-flammable nature.
2- The container or bin in which the cargo is carried must be made of material which is at least flash resistant.
3- The cargo may be carried in a passenger seat if properly secured by a safety belt.
4- The bin in which the cargo is carried must not be installed in a position that restricts access to, or use of, any emergency exit.

018. What instrument flight time may be logged by a pilot second in command of a two-
B13 pilot domestic air carrier flight?

1- All of the time the airplane is in actual IFR conditions or the pilot is wearing a view-limiting device.
2- All of the time the pilot is controlling the airplane solely by reference to flight instruments.
3- One-half the time the flight is on an IFR flight plan.
4- One-half the time the airplane is in actual IFR conditions.

019. Which operational requirement must be observed when ferrying an air carrier
D18 airplane when one of its three turbine engines is inoperative?

1- Weather conditions must exceed the basic VFR minimums for the entire route, including takeoff and landing.
2- The flight cannot be conducted between official sunset and official sunrise.
3- The weather conditions at takeoff and destination must be VFR.
4- The computed takeoff run must not exceed 50% of the available runway; the computed landing distance must not exceed 60% of the available runway.

020. When cargo is carried aft of the fore-
E19 most seated passengers in an air carrier airplane, what requirement must be met regarding this cargo?

1- The cargo may be carried in an open bin if it is of a non-toxic or non-flammable nature.
2- The container or bin in which the cargo is carried must be made of material which is at least flash resistant.
3- The cargo may be carried in a passenger seat if properly secured by a safety belt.
4- The bin in which the cargo is carried must not be installed in a position that restricts access to or use of any required emergency exit.

021. Which is <u>one</u> of the requirements that must be met by a required pilot flight
F34 crewmember in reestablishing recency of experience?

1- At least two takeoffs must be made with a simulated failure of the most critical power-plant.
2- If Category II qualified, at least one approach to landing must be made to a CAT II DH of 150 feet AGL.
3- At least one landing must be made to a complete stop.
4- At least one non-precision approach must be made to the lowest minimums authorized for the certificate holder.

022. An air carrier airplane has a seating capacity for 67 passengers. How many
E31 approved first aid kits are required for the treatment of minor accidents likely to occur in flight?

1- 5
2- 4
3- 3
4- 2

023. To act as pilot in command of an airplane for an IFR flight requiring an
B14 Airline Transport Pilot Certificate, you must have had at least

1- 2 hours of actual or simulated instrument flight time within the preceding 90 days.
2- 6 hours of actual or simulated instrument flight time within the preceding 6 calendar months.
3- 2 hours of instrument flight time under actual or simulated instrument flight conditions, or 2 hours in a simulator, within the preceding 6 months.
4- 2 hours of instrument flight time under actual or simulated instrument flight conditions within the preceding 6 months.

024. What is the highest flight level that operations may be conducted without
E37 the pilot at the controls wearing and using an oxygen mask while the other pilot is away from the duty station?

1- FL 410
2- FL 310
3- FL 250
4- FL 180

025. An airplane operating under FAR Part 121, equipped with a single ADF
E42 receiver, is to be flown in VFR conditions over a route not navigated by pilotage. This airplane must also be equipped with

1- VOR and marker beacon receivers.
2- VOR, ILS, and marker beacon receivers.
3- one VOR and DME.
4- dual VOR receivers and one DME.

026. To renew CAT II authorization, what is the minimum recent instrument approach
B20 experience required prior to the due date of the practical test?

1- Within the previous 12 months three ILS approaches flown by use of an approach coupler to CAT II minimum landing altitudes.
2- Within the previous 12 calendar months, six ILS approaches flown by use of an approach coupler to CAT II minimum landing altitudes.
3- Within the previous 6 months, six ILS approaches, three of which may be flown to CAT I minimum landing altitudes by use of an approach coupler.
4- Within the previous 12 months, six ILS approaches flown manually to CAT I minimum landing altitudes.

027. At what maximum indicated airspeed can a Boeing 727 operate within the Los
D20 Angeles TCA without special ATC authorization?

1- 200 knots
2- 230 knots
3- 250 knots
4- 275 knots

028. For a 2-hour flight in a turbine engine powered airplane at a cabin pressure
E36 altitude of 12,000 feet, how much supplemental oxygen for sustenance must be provided? Enough oxygen for

1- 10% of the passengers for 1.5 hours.
2- each passenger during the entire flight.
3- each passenger for 30 minutes.
4- 30% of the passengers for the entire flight.

029. What is the recent instrument approach experience required prior to the due
B20 date of the practical test for pilots to renew their CAT II authorization? Within the previous

1- 12 months, six ILS approaches flown manually to CAT II DHs.
2- 6 months, six ILS approaches flown to CAT I DHs, three of which may be by the use of an approach coupler.
3- 6 months, three ILS approaches flown by the use of an approach coupler to CAT II DHs.
4- 12 months, six ILS approaches flown by the use of an approach coupler to CAT II DHs.

030. An airplane operating under FAR Part 121, equipped with a single ADF
E42 receiver, is to be flown in VFR over-the-top conditions navigating by low frequency radio facilities. This airplane must also be equipped with

1- one VOR and marker beacon receivers.
2- one VOR and DME.
3- dual VOR receivers and one DME.
4- VOR, ILS, and marker beacon receivers.

031. Above which minimum cabin altitude must supplemental oxygen be provided for all
E36 persons during an entire flight on a turbojet powered airplane?

	Crewmembers	Passengers
1-	10,000 feet	15,000 feet
2-	10,000 feet	12,000 feet
3-	12,000 feet	15,000 feet
4-	14,000 feet	14,000 feet

032. During Category II operations, an operative rollout runway visual range
D12 system is required when the RVR in the touchdown zone is reported to be less than

1- RVR 14.
2- RVR 16.
3- RVR 18.
4- RVR 20.

033. All flight crewmembers on flight deck duty on a turbine engine powered, pres-
E37 surized airplane are not equipped with quick-donning oxygen masks. In this case, the maximum flight altitude authorized without one pilot wearing and using an oxygen mask is

1- FL 410.
2- FL 300.
3- FL 250.
4- FL 200.

034. The pilot in command of a domestic air carrier airplane must have had certain
B11 experience with the make and basic model flight control guidance system used during a CAT II instrument approach. What is that recent experience requirement?

	Number of ILSs	Time Period
1-	3	Within preceding 6 months
2-	6	Within preceding 6 months
3-	3	Within preceding 3 months
4-	6	Within preceding 3 months

035. What action should be taken by the pilot in command if the airborne weather radar
E43 becomes inoperative en route on an air carrier IFR flight for which weather reports indicate possible thunderstorms?

1- Return to the departure airport if closer than the destination airport.
2- Proceed in accordance with the approved instructions in the air carrier's operations manual for such an event.
3- Fly to and land at the nearest approved air carrier airport.
4- Request ATC for radar vectors to the nearest airport suitable for large aircraft landings.

036. Which condition meets the minimum recent IFR experience requirement for a pilot
B14 to act as pilot in command of an airplane for an IFR flight requiring an Airline Transport Pilot Certificate?

1- An instrument competency check administered by another pilot qualified as pilot in command.
2- Three hours of instrument flight time under simulated flight conditions within the preceding 180 days.
3- Two hours of actual or simulated instrument flight time within the preceding 90 days.
4- An instrument competency check in the category of aircraft involved.

037. Under which conditions are two persons permitted to share one safety belt in
E33 a divan?

1- For all operations except the en route portion of the flight.
2- During all operations except during the landing phase of flight.
3- Only during the en route portion of flight.
4- When one is an adult and one is a child under 4 years of age.

038. When computing takeoff weight limitations, for which aircraft is the "clear-
E15 way" considered for a particular runway?

1- Passenger-carrying transport airplanes.
2- Large aircraft (more than 12,500 pounds).
3- U.S. certificated air carrier airplanes.
4- Turbine-engine powered transport airplanes.

039. Which ground components are required to be operative for a CAT II approach
D12 in addition to LOC, glide slope, marker beacons, and approach lights?

1- Radar and RVR.
2- HIRL, TDZL, RCLS, and REIL.
3- RCLS and REIL.
4- HIRL, TDZL, RCLS, and RVR.

040. The pilot in command of a flag air carrier airplane must have had
B20 certain experience with the make and basic model flight control guidance system used during a CAT II instrument approach. What is that recent experience requirement?

	Time Period	Number of ILSs
1-	Within preceding 6 months	3
2-	Within preceding 6 months	6
3-	Within preceding 12 months	6
4-	Within preceding 9 months	6

041. In an emergency requiring immediate action, the pilot in command may
D10 deviate from any rule of FAR Part 91 to the extent

1- necessary except flight contrary to an ATC clearance.
2- necessary to meet that emergency.
3- authorized by the air carrier's operations specifications.
4- necessary to conform to ATC instructions.

042. When carrying cargo forward of the foremost seated passengers, what
E19 restrictions must be observed?

1- All cargo must be carried in a suitable bin and secured to the floor structure of the airplane.
2- The cargo may be carried in an open bin if the bin is of a non-toxic or non-flammable nature.
3- Cargo may be carried in a passenger seat if properly secured by a safety belt.
4- All cargo must be separated from all passengers by a partition capable of withstanding specific load stresses.

043. Information recorded during normal operation by a required cockpit voice recorder
E44 in a passenger-carrying airplane

1- must be retained for 30 minutes after landing.
2- may be erased only once each flight.
3- may all be erased except the last 30 minutes after recording.
4- must be retained for at least 12 hours.

044. What additional airplane equipment (in addition to that basic equipment
D50 necessary for CAT II operations), is required for CAT II decision heights below 150 feet?

1- Dual radio altimeter systems.
2- Both aural and visual indications of the inner marker location must be provided.
3- Dual glide slope and localizer receiving antennae.
4- Low altitude alert warning system.

045. When carrying cargo forward of the foremost seated passengers, what restric-
E19 tions must be observed?

1- Cargo may be carried in a passenger seat if properly secured by a safety belt.
2- The cargo may be carried in an open bin if the bin is of a non-toxic or non-flammable nature.
3- All cargo must be carried in a suitable bin and secured to the floor structure of the airplane.
4- All cargo must be separated from all passengers by a partition capable of withstanding specific load stresses.

046. In what altitude structure is an operative, appropriately equipped ATC trans-
D16 ponder required when operating in all controlled airspace of the 48 contiguous states and the District of Columbia?

1- Above 12,500 feet MSL, excluding the airspace at and below 1,500 feet AGL.
2- Above 14,500 feet AGL, excluding the airspace at and below 1,200 feet AGL.
3- Above 12,500 feet MSL, excluding the airspace at and below 2,500 feet AGL.
4- Above 14,500 feet MSL, excluding the airspace at and below 2,500 feet AGL.

047. What information, if any, recorded during normal operation by a cockpit
E44 voice recorder may be erased or otherwise obliterated?

1- All information except that recorded more than 1 hour previously.
2- All information except that recorded within the latest 30-minute period.
3- No amount of information may be erased.
4- All information may be erased.

048. What is the lowest altitude or flight level a flight can be conducted without having a crewmember instruct
E37 passengers on the proper use of supplemental oxygen?

1- 14,500 feet MSL
2- FL 180
3- FL 250
4- FL 300

049. If a flag air carrier flight lands at an intermediate airport at 1825Z, what
I11 is the latest time it may depart before a redispatch release is required for the destination airport?

1- 0025Z
2- 0125Z
3- 2025Z
4- 1925Z

050. In addition to ensuring that appropriate aeronautical charts and approach pro-
H18 cedures charts are aboard each aircraft, what other item of equipment must be available for each crewmember on each flight?

1- Sun glasses
2- Personal oxygen mask
3- Protective gloves
4- Flashlight

051. While in controlled airspace in VFR conditions, what distance from cloud
D30 criteria should be maintained when flying below 1,200 feet AGL?

1- 500 feet below; 500 feet above; 1 mile horizontal.
2- Clear of clouds.
3- 500 feet below; 500 feet above; 2,000 feet horizontal.
4- 500 feet below; 500 feet above; 1,000 feet horizontal.

052. An airline transport pilot instructing other pilots in air transportation
B32 service is restricted to

1- a maximum of 7 hours of instruction in any 1 day.
2- instruction only in aircraft with functioning dual controls.
3- a maximum of 30 hours of instruction in any 7-day period.
4- instruction in any aircraft of the category for which a rating is held.

053. Before each takeoff of a passenger-carrying airplane, on what items shall
H26 the passengers be orally briefed?

1- Proper use of seat belts, smoking, and location of emergency exits.
2- Location of emergency exits, use of oxygen masks, and life preservers.
3- Proper use of seat belts, life preservers, and oxygen masks.
4- Proper use of liferafts, oxygen masks, and location of emergency exits.

054. Should it become necessary to shut one engine down on a domestic air carrier
H24 three-engine jet transport, the pilot in command

1- may continue to the planned destination if VFR can be maintained including approach and landing.
2- may continue to the planned destination if approved by the dispatcher.
3- may continue to the planned destination if this is considered as safe as landing at a closer airport.
4- must land at the nearest suitable airport in point of time.

055. A person who appears to be intoxicated has created a disturbance aboard an air
H28 carrier aircraft. Within which time period shall the certificate holder submit a written report of the incident to the Administrator?

1- 10 days
2- 7 days
3- 5 days
4- 48 hours

056. What are the line check requirements for the pilot in command for a domestic air
F35 carrier?

1- The line check is required only when the pilot is scheduled to fly a new route.
2- The line check is required each 12 calendar months in one of the types of airplanes to be flown.
3- The line check is required each 12 calendar months in each type of aircraft in which the pilot may serve.
4- If the pilot has had refresher flight training in the same type airplane within the preceding 90 days, the line check may be waived.

057. An airplane requires only one battery-powered megaphone. Unless waived by
E31 the Administrator, what should be the location of the megaphone within the cabin of a domestic air carrier passenger-carrying airplane?

1- The most rearward location readily accessible to a normal flight attendant seat.
2- As close as practicable to the midsection of the airplane.
3- The most accessible location in the forward portion of the cabin.
4- On the flight deck readily accessible to any crewmember.

058. What minimum RVR value requires an operative rollout RVR system for CAT II
D12 operations?

1- RVR 24
2- RVR 18
3- RVR 16
4- RVR 14

059. Which is a correct airplane speed symbol and definition?
A20

1- V_F - maximum speed for flap extension.
2- V_{LE} - maximum landing gear operating speed.
3- V_{MA} - design maximum maneuvering speed.
4- V_C - design cruising speed.

060. ATC requests a detailed report of the inflight emergency that required your
D21 flight to be issued a priority clearance. This report must be submitted no later than

1- 48 hours to the chief of that ATC facility.
2- 10 days to the FAA Administrator.
3- 24 hours to the nearest FAA district inspector.
4- 7 days to the Chief of the National Transportation Safety Board.

061. What restriction is imposed by FAR Part 61 regarding flight instruction of other
B32 pilots in air transportation by an airline transport pilot? A pilot may instruct no more than

1- 36 hours in any 7-day period.
2- 30 hours in any 7-day period.
3- 7 hours in any 1-day period.
4- 6 hours in any 1-day period.

062. An appropriate number of acceptable oxygen-dispensing units are required for
E37 first aid treatment of occupants for physiological reasons following descents from cabin pressure altitudes above FL 250. What is the minimum number required?

1- One
2- Two
3- Four
4- Six

063. What minimum number of approved first aid kits are required for treatment of
E31 injuries likely to occur in flight on an air carrier airplane with a seating capacity in excess of 250?

1- 8
2- 6
3- 4
4- 2

064. In determining takeoff limitations for a turbine engine powered transport cate-
E15 gory airplane, what restrictions apply to the net takeoff path data?

1- The takeoff run must not exceed the length of the runway plus any stopway.
2- The airplane is not banked more than 15° after reaching a height of 50 feet.
3- The airplane is not banked before reaching a height of 150 feet.
4- The airplane is not banked more than 30° after reaching a height of 100 feet.

065. Domestic air carriers operating IFR on victor or jet airways must be equipped
E42 with an approved DME receiver

1- for operations in positive airspace only.
2- regardless of operating altitude.
3- for operations at or above FL 180 only.
4- for operations at or above FL 240 only.

066. To serve as pilot in command during a CAT II approach, a pilot must have had
B11 certain experience with the make and basic model flight control guidance system used in that operation. What does this required recent experience include?

1- Three ILS approaches within the preceding 3 months.
2- Six ILS approaches within the preceding 6 months.
3- Three ILS approaches within the preceding 6 months.
4- Six ILS approaches within the preceding 3 months.

067. What are the certificate and rating requirements for the pilot second in
F33 command of a supplemental air carrier flight requiring three pilots?

1- Commercial pilot with airplane type rating only.
2- Commercial pilot with airplane type and instrument rating.
3- Commercial pilot with instrument rating only.
4- Airline transport pilot with airplane type rating.

068. What are the certificate and rating requirements for the pilot second in
F33 command of a commercial operator air carrier flight requiring three pilots?

1- Commercial pilot with airplane type and instrument rating.
2- Airline transport pilot with airplane type rating.
3- Commercial pilot with instrument rating only.
4- Commercial pilot with airplane type rating only.

069. Except during an actual emergency, when must emergency lights in a passenger
E32 carrying airplane be armed or turned ON?

1- During taxiing, takeoff, and landing.
2- For night operations and extended overwater operations only.
3- Prior to every flight during preflight.
4- On preflight prior to night flights.

070. An airplane operating under FAR Part 121, equipped with a single ADF
E42 receiver, is to be flown in VFR over-the-top conditions navigating by low frequency radio facilities. With what additional equipment must this airplane be equipped?

1- TACAN or Doppler radar.
2- VOR, ILS, and marker beacon receivers.
3- Dual VOR receivers and one DME.
4- VOR and marker beacon receivers.

071. Which minimum condition meets the requirement for a pilot in command of
F39 a domestic air carrier to maintain route qualification?

1- One trip between terminals within the preceding 6 months.
2- One trip between terminals within the preceding 12 months.
3- One takeoff and landing at each regular, provisional, and refueling airport within the preceding 6 months.
4- Two round trips between terminals within the preceding 12 months.

072. For domestic or flag air carrier operations, the pilot in command line check
F35

1- must include a landing at each regular, provisional, and refueling stop along the route.
2- is required each 12 calendar months in only one type of aircraft in which the pilot serves as pilot in command.
3- may be waived if the pilot has had refresher flight training in the aircraft type within the preceding 6 months.
4- is required only when the pilot is scheduled on a new route.

073. Transport category airplanes (except C-46 type airplanes), operated in the
E43 conterminous United States, must have airborne weather radar equipment installed

1- regardless of the airplane size and use.
2- only if the airplane's maximum takeoff weight is over 50,000 pounds and it is used in passenger operations.
3- only if the airplane is jet powered and used in passenger operations.
4- regardless of the airplane size and powerplants, unless it is used for cargo-only operations.

074. When a flight engineer is a required crewmember, which is an operational
F10 requirement regarding the qualifications of all flight deck crewmembers?

1- The pilot in command and second in command must hold flight engineer certificates.
2- No other flight deck crewmember need be qualified or certificated.
3- One of the pilots must be qualified to perform flight engineer duties; no flight engineer certificate is required.
4- One pilot must hold a flight engineer's certificate.

075. While in controlled airspace in VFR conditions, what distance from clouds
D30 should be maintained when flying more than 1,200 feet AGL, but below 10,000 feet MSL?

1- 500 feet below; 1,000 feet above; 2,000 feet horizontal.
2- 1,000 feet below; 1,000 feet above; 1 mile horizontal.
3- 500 feet below; 500 feet above; 1,000 feet horizontal.
4- 1,000 feet below; 500 feet above; 2,000 feet horizontal.

076. In addition to the localizer, glide slope, marker beacons, approach
D12 lighting, and HIRL, which ground components are required to be operative for a CAT II instrument approach to a DH below 150 feet AGL?

1- TDZL, RCLS, and REIL.
2- RCLS and REIL.
3- Radar and RVR.
4- TDZL, RCLS, and RVR.

077. What are the minimum certificate and rating requirements for the pilot
F33 second in command of a three-pilot crew on a flag air carrier flight?

1- Airline Transport Pilot Certificate with an airplane category rating.
2- Commercial Pilot Certificate with an instrument rating.
3- Airline Transport Pilot Certificate with an aircraft type rating.
4- Commercial Pilot Certificate with an airplane type rating.

078. While in controlled airspace in VFR conditions, what distance from clouds
D30 should be maintained when flying more than 1,200 feet AGL, and at or above 10,000 feet MSL?

1- 1,000 feet below; 1,000 feet above; 1 statute mile horizontal.
2- 500 feet below; 1,000 feet above; 1 statute mile horizontal.
3- 1,000 feet below; 500 feet above; 2,000 feet horizontal.
4- 500 feet below; 1,000 feet above; 2,000 feet horizontal.

079. What check, or checks, must a pilot second in command of a three-pilot
F36 flight crew complete to meet currency requirements?

1- A proficiency check or a line check every 6 calendar months.
2- A proficiency check every 12 calendar months.
3- A proficiency check or an approved simulator course each 6 calendar months.
4- A line check every 12 calendar months.

080. What recent instrument experience must you have had to act as pilot in command
B14 of an airplane for an IFR flight requiring an Airline Transport Pilot Certificate?

1- Two hours of instrument flight time under actual or simulated instrument flight conditions within the preceding 6 months.
2- Six hours of actual or simulated instrument flight time within the preceding 6 calendar months.
3- Two hours of actual or simulated instrument flight time within the preceding 90 days.
4- Two hours of instrument flight time under actual or simulated instrument flight conditions, or 2 hours in a simulator, within the preceding 6 months.

081. Which ground component or equipment is not required for a CAT II ILS instru-
D12 ment approach to the published RA decision height of 150 feet?

1- RVR system for the touchdown zone.
2- The Inner Marker.
3- Touchdown Zone Lighting.
4- Centerline lighting and marking.

082. A flag air carrier flight lands at an intermediate airport at 1322Z. What
I11 is the latest time it may depart for the destination airport without a redispatch release?

1- 0122Z
2- 1922Z
3- 1622Z
4- 1422Z

083. The emergency lights on a passenger carrying airplane must be armed or
E32 turned ON during actual emergencies and

1- on preflight prior to night operations.
2- for night operations and extended overwater operations only.
3- during taxiing, takeoff, and landing.
4- prior to every flight during preflight.

084. What is the minimum number of flight attendants required for an airplane
F11 having a seating capacity of 160 passengers, if only 100 passengers are aboard?

1- Five
2- Four
3- Three
4- Two

085. A flight crew of two pilots originally scheduled out on a domestic flight was
G20 delayed on the inbound flight and now has 5 1/2 hours of duty aloft within the preceding 24 hours. This crew can be dispatched

1- only after 11 hours of rest.
2- without rest, provided the estimated time en route is not more than 2 1/2 hours.
3- after 8 hours of rest only, provided the estimated time en route is not more than 2 1/2 hours.
4- only after 16 hours of rest.

086. When operating to an airport with an operating control tower each pilot of a
D24 large airplane shall, unless otherwise required by the applicable distance from cloud criteria, enter the airport traffic area and, until further descent is necessary for landing, maintain an altitude above the surface of at least

1- 2,500 feet.
2- 1,500 feet.
3- 1,200 feet.
4- 1,000 feet.

087. Which procedure should you follow if it should become necessary to shut down one
H24 engine on a three-engine domestic air carrier airplane after takeoff?

1- Proceed to an airport as directed by the company dispatcher.
2- Land at any airport you consider as safe as the nearest suitable airport in point of time.
3- Land at the nearest suitable airport in point of time only.
4- Land at the takeoff alternate airport listed in the original flight release.

088. Your logbook shows these entries:

G10 April 28 - 4.5 hrs. - Air carrier flight
April 29 - 6.5 hrs. - Air carrier flight
April 30 - 5.5 hrs. - Charter flight
May 1 - 3.0 hrs. - Flight instruction
2.0 hrs. - Pleasure flight
May 3 - 1.0 hr. - Pleasure flight
May 4 - 7.5 hrs. - Air carrier flight

How many additional hours, if any, can you fly for this domestic air carrier on May 5 and not exceed the maximum authorized in any 7 consecutive days?

1- None
2- 3.0 hours
3- 5.5 hours
4- 7.5 hours

089. Which is a requirement regarding the erasure of data in a flight recorder,
E40 for the purpose of testing?

1- A maximum of 45 minutes of the oldest prerecorded data may be erased.
2- A total of 1 hour of the oldest recorded data accumulated at the time of testing may be erased.
3- A total of no more than 1 hour of recorded data may be erased.
4- A maximum of 30 minutes of prerecorded data may be erased.

090. The supplemental oxygen requirements for passengers when a flight is operated up
E37 to FL 250 is dependent upon the airplane's ability to make an emergency descent to a flight altitude of

1- 8,000 feet at a minimum rate of 3,000 feet per minute.
2- 10,000 feet within 4 minutes.
3- 14,000 feet within 4 minutes.
4- 12,000 feet within 4 minutes, or at a minimum rate of 2,500 feet per minute, whichever is quicker.

091. The pilot in command line check for a domestic air carrier pilot must be
F35

1- administered within the preceding 12 months in all types of airplanes in which the pilot is to fly.
2- administered by a pilot check airman who is currently qualified on both the route and the airplane.
3- administered within the preceding 90 days after being type rated in a different airplane.
4- flown during daylight hours only and include a regular refueling stop along the route.

092. If your airplane flight manual specifies a maximum altitude loss of 75 feet for
H29 an autopilot malfunction, what is the lowest height above the terrain the autopilot may be used during en route operations, including climb and descent?

1- 125 feet
2- 150 feet
3- 175 feet
4- 500 feet

093. Which instrument indicates that both VOR navigation systems are within
D17 accepted tolerances for a VOT check? (Fig. 1)

1- D
2- C
3- B
4- A

094. Which instrument indicates that both VOR navigation systems are within
D17 accepted tolerances for a VOT check? (Fig. 2)

1- D
2- C
3- B
4- A

095. Which instrument indicates that both VOR navigation systems are within
D17 accepted tolerances for a VOT check? (Fig. 3)

1- D
2- C
3- B
4- A

096. What is the maximum permissible variation between the two bearing indicators
D17 on a dual VOR system when checking one VOR against the other? (Each unit is independent of each other except for the receiving antenna.)

1- Six degrees in flight and four degrees on the ground.
2- Four degrees on the ground and in flight.
3- Six degrees on the ground and in flight.
4- Four degrees in flight and six degrees on the ground.

097. A commercial pilot has a DC-9 and DC-3 type rating. A flight test is completed
B32 for an Airline Transport Pilot Certificate in a Boeing 727. What pilot privileges may be exercised?

1- ATP - Boeing 727 and DC-3; Commercial - DC-9.
2- ATP - Boeing 727 only; Commercial - DC-9 and DC-3.
3- ATP - Boeing 727 and DC-9; Commercial - DC-3.
4- ATP - Boeing 727, DC-9, and DC-3.

098. Your flight logbook for the month of July shows these entries:
G10

July 3 - pleasure flight - 3.7
July 4 - charter flight - 4.5
July 6 - pleasure flight - 4.0
July 7 - flight instruction - 6.4
July 9 - air carrier flight - 3.8
July 10 - charter flight - 6.4

How many additional hours can you fly for this domestic air carrier on July 12 without exceeding the maximum authorized in any 7 consecutive days?

1- 17.4 additional hours
2- 13.4 additional hours
3- 4.9 additional hours
4- .2 additional hours

099. Within which maximum preceding time period must a pilot in command of a
F38 supplemental air carrier operation certify the possession of adequate knowledge in specific areas of operation to remain route and airport qualified?

1- 180 days
2- 90 days
3- 60 days
4- 30 days

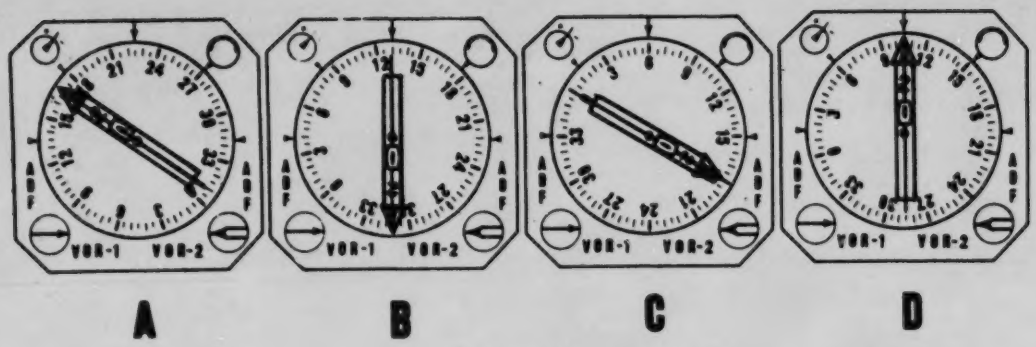


Figure 1

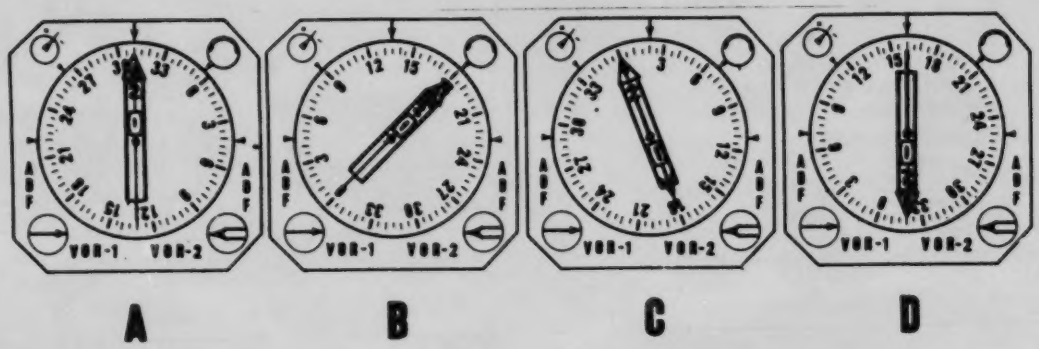


Figure 2

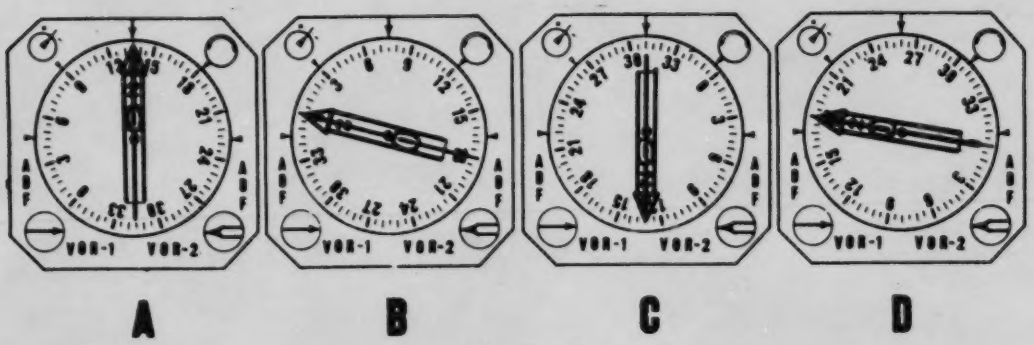


Figure 3

100. A copy of which documents is a flag air carrier required to carry aboard
I74 each airplane to the destination airport?

1- Load manifest and dispatch release.
2- Weight and balance release and flight plan.
3- Dispatch release, and weight and balance release.
4- Dispatch release, load manifest, and flight plan.

101. The airplane is certificated for operation with a minimum flight deck crew
F10 of two pilots and one flight engineer. For domestic air carrier operations under FAR Part 121, the flight engineer must be qualified, certificated, and current. In addition, in case of emergency,

1- each pilot must be qualified to perform flight engineer duties.
2- at least one pilot must have served as flight engineer within the preceding 90 days.
3- the flight engineer must be qualified to perform duties at one pilot position.
4- at least one pilot must be qualified to perform flight engineer duties.

102. What are the IFR takeoff minimums for commercial operators?
I47

1- One-half statute mile--aircraft having more than two engines.
2- As specified in the operations specifications.
3- As printed on the approach chart for that runway.
4- As printed on IFR takeoff and departure procedures.

103. Your FAR Part 121 flight time as pilot in command consists of only 80 hours in
I48 a DC-10 type airplane. How does this affect the MDA, DH, or minimum visibility for IFR CAT I approaches?

1- Has no affect.
2- MDA or DH and visibility minimums are decreased by 100 feet and 1/2 mile.
3- MDA or DH and visibility minimums are increased by 100 feet and 1/2 mile.
4- The MDA or DH is decreased by 100 feet.

104. As pilot in command, you are given a priority ATC clearance during an emer-
D21 gency and do not deviate from a rule of FAR Part 91. What report, if any, is required?

1- None, since no deviation from a rule of FAR Part 91 was made.
2- Within 72 hours to the chief of that ATC facility.
3- Within 48 hours to the chief of that ATC facility when requested.
4- Within 48 hours to the nearest FAA Air Carrier District Office.

105. You are pilot in command of a flag air carrier airplane having a three-pilot
G22 crew and one additional flight crewmember. What is the maximum number of hours you may fly during any 12-calendar month period?

1- 900 hours
2- 1,000 hours
3- 1,200 hours
4- 1,500 hours

106. What is the maximum time a flag air carrier may remain on the ground after
I11 landing at an intermediate airport before a redispatch release is required for the destination airport?

1- 6 hours
2- 3 hours
3- 1 hour
4- 30 minutes

107. One item of information that must be contained in the load manifest for a
I72 domestic air carrier is the

1- distribution of passengers and cargo.
2- CG position at takeoff.
3- maximum allowable weight for the flight.
4- names of passengers.

108. Which information must be contained in, or attached to, the dispatch release for
I70 a flag air carrier flight?

1- Type of operation (e.g., IFR, VFR).
2- Total fuel supply on board the airplane.
3- Passenger manifest and cargo weight.
4- Weight and balance data.

109. A flag air carrier transport category airplane is certificated for operation
F10 with a fully qualified, minimum flight deck crew of two pilots and one flight engineer. In addition, in case of emergency,

1- at least one pilot must be qualified to perform flight engineer duties.
2- at least one pilot must have served as flight engineer within the preceding 90 days.
3- the flight engineer must be qualified to perform duties at one pilot position.
4- each pilot must be qualified to perform flight engineer duties.

110. While en route, an assigned pilot in command is taking a rest period away
H14 from the flight deck duty station. What are the requirements for the relief pilot?

1- Airline Transport Pilot Certificate and appropriate type rating.
2- Commercial Pilot Certificate and type rating.
3- Airline Transport Pilot Certificate; no type rating is required.
4- Commercial Pilot Certificate and instrument rating.

111. In addition to the basic aircraft equipment required for CAT II operations,
D50 which additional equipment is necessary for CAT II instrument approaches with decision heights below 150 feet AGL?

1- A radio altimeter displaying height of the flight deck within plus or minus 5 feet above the terrain.
2- A third gyroscopic pitch-and-bank indicating system.
3- Dual localizer and glide slope receiver antennas.
4- A marker beacon receiver providing visual and aural indications of the inner marker.

112. What information from the load manifest must the pilot in command of a domestic
I72 air carrier operator carry to the destination airport?

1- Cargo and passenger distribution.
2- Names of passengers.
3- Evidence that the aircraft is loaded according to an approved schedule.
4- The maximum allowable weight for that flight.

113. Which certificated air carrier operator must prepare a load manifest containing
I73 information concerning the airplane at takeoff, with regard to the maximum allowable takeoff weight for the intended runway?

1- Supplemental only.
2- Flag and Domestic.
3- Domestic only.
4- Commercial and Supplemental.

114. The prescribed takeoff minimum of RVR 32 for the runway of intended operation
D41 is not reported. What minimum ground visibility shall be used in lieu of the RVR requirement?

1- 3/4 statute mile
2- 5/8 statute mile
3- 3/8 statute mile
4- 1/2 statute mile

115. Any person whose duties include the handling or carriage of dangerous
F31 articles and magnetized materials must have satisfactorily completed an established and approved training program within the preceding

1- 24 calendar months.
2- 12 calendar months.
3- 6 months.
4- 3 months.

116. What is the maximum indicated airspeed a turbine-powered aircraft may be
D20 operated below 10,000 feet MSL?

1- 200 knots
2- 230 knots
3- 250 knots
4- 288 knots

117. A refueling airport within the continental United States has no prescribed
I34 takeoff minimums. If this airport is <u>not</u> listed in the air carrier's operations specifications, which of the following minimum weather conditions must exist at takeoff?

1- 800-2 1/2
2- 800-3
3- 900-1 1/2
4- 1,000-2

118. What flying equipment must be readily available for the use of each crew-
H18 member on each flight?

1- Sun glasses
2- Flashlight
3- Protective gloves
4- Personal oxygen mask

119. Your FAR Part 121 flight time as pilot in command consists of only 100 hours
I48 in a Boeing 707 type airplane. How does this affect the MDA, DH, or minimum visibility for IFR CAT I approaches?

1- MDA or DH and visibility minimums are increased by 100 feet and 1/2 mile.
2- Has no affect.
3- MDA or DH and visibility minimums are decreased by 100 feet and 1/2 mile.
4- The MDA or DH is decreased by 100 feet.

120. What information from the load manifest must the pilot in command of a
I72 domestic air carrier operator carry to the destination airport?

1- Cargo and passenger distribution.
2- Evidence that the aircraft is loaded according to an approved schedule.
3- Names of passengers.
4- Flight number and statement of type of operation (e.g., IFR, VFR).

121. To maintain route qualification, the pilot in command (as pilot or other
F39 flight crewmember) must have made at least

1- one trip between terminals within the preceding 3 months.
2- two round trips between terminals within the preceding 12 months.
3- one takeoff and landing at each regular, provisional, and refueling airport within the preceding 6 months.
4- one trip between terminals within the preceding 12 months.

122. What minimum ground visibility shall be used in lieu of a prescribed take-
D41 off minimum of RVR 32 when that RVR requirement is not reported?

1- 1/2 statute mile
2- 3/8 statute mile
3- 5/8 statute mile
4- 3/4 statute mile

123. What are the requirements for a pilot that is to relieve the pilot second in
H14 command of a three-pilot crew for a rest period on flight deck duty during the en route portion of a flight?

1- Airline Transport Pilot Certificate; no type rating is required.
2- Commercial Pilot Certificate with class and type rating.
3- Airline Transport Pilot Certificate with appropriate type rating.
4- Commercial Pilot Certificate and instrument rating.

124. When takeoff minimums are not prescribed for a civil airport, what are
D41 the takeoff minimums under IFR for a three-engine airplane?

1- 2,000 feet RVR
2- 300 feet and 1/2 statute mile
3- 1/2 statute mile
4- 1 statute mile

125. What is the maximum indicated airspeed a reciprocating engine airplane may be
D20 operated within a TCA?

1- 250 knots
2- 230 knots
3- 200 knots
4- 180 knots

126. When a flight is operated up to FL 250, what operational consideration deter-
E37 mines the supplemental oxygen requirement for passengers?

1- The passenger load versus seating capacity.
2- The airplane's ability to make an emergency descent to 14,000 feet MSL within 4 minutes.
3- The airplane's ability to make a normal descent to 14,000 feet MSL within 8 minutes.
4- The seating capacity of the airplane.

127. What is the maximum distance specified for an alternate airport for two-engine
I20 airplanes, if weather conditions at the departure airport are below the landing minimums in the operations specifications for that airport?

1- Two hours at normal cruise speed in still air with both engines operating.
2- Two hours at normal cruise speed in still air with one engine operating.
3- One hour at normal cruise speed in still air with one engine operating.
4- One hour at normal cruise speed in still air with both engines operating.

128. The minimum steady flight speed or stalling speed in the landing config-
A20 uration is represented by the symbol

1- V_S.
2- V_{S1}.
3- V_A.
4- V_{SO}.

129. A person, in the custody of law enforcement personnel, is scheduled on your
H31 flight. What procedures are required regarding boarding of this person and the escort?

1- They shall enplane and deplane before all other passengers.
2- They shall be boarded after all other passengers enplane, and deplaned before all other passengers deplane.
3- They shall be boarded before all other passengers enplane, and deplaned after all passengers have left the aircraft.
4- They must be seated next to, or directly across from, the rearmost emergency exit.

130. Within what time period before departure should a certificate holder
H31 normally be notified that a person, in the custody of law enforcement personnel, will be aboard the aircraft?

1- At least 5 hours, if the person being escorted is considered dangerous by the government entity having custody.
2- At least 1 hour.
3- Anytime, provided the escorted person is seated in the foremost portion of the passenger cabin.
4- At least 2 hours.

131. A passenger notifies the certificate holder prior to checking baggage that
H32 an unloaded weapon is in the baggage. What is the requirement regarding this baggage aboard the aircraft?

1- The baggage may be carried in the flight crew compartment, provided the baggage remains locked.
2- The baggage must remain locked and only the passenger retains the key.
3- The baggage must remain locked and custody of the key shall remain with a designated person other than the owner of the weapon.
4- The baggage must be placed under the passenger's seat and the key retained by a flight crewmember.

132. At what maximum indicated airspeed may reciprocating-engine aircraft be oper-
D20 ated within an Airport Traffic Area?

1- 230 knots
2- 200 knots
3- 180 knots
4- 156 knots

133. The maximum altitude loss for a malfunctioning automatic pilot with an approach
H29 coupler for your airplane is 45 feet. The reported weather conditions for a particular airport are better than basic VFR minimums. To what minimum altitude can the automatic pilot be used for an ILS approach to a landing?

1- 105 feet AGL
2- 95 feet AGL
3- 50 feet AGL
4- 30 feet AGL

134. You are assigned as a flight crewmember for a flag air carrier using three
G22 pilots and an additional flight crewmember. What is the maximum number of hours you may fly during any 90 consecutive days?

1- 275 hours
2- 300 hours
3- 325 hours
4- 350 hours

135. A pilot, second in command of a three-pilot flight crew, must complete a
F36 proficiency check

1- or an approved simulator course every 6 calendar months.
2- or a line check every 12 calendar months.
3- or a line check every 6 calendar months.
4- every 12 calendar months.

136. What is the minimum number of flight attendants required for an air carrier
F11 airplane which has a seating capacity for 335 passengers when 299 passengers are aboard?

1- Seven
2- Six
3- Five
4- Four

137. Which indication is within acceptable tolerances when checking a dual VOR
D17 installation using a VOT?

	VOR #1	TO/FROM	VOR #2	TO/FROM
1-	360°	TO	002°	TO
2-	180°	TO	182°	TO
3-	001°	FROM	005°	FROM
4-	180°	FROM	184°	FROM

138. An operative, appropriately equipped transponder is required in controlled
D16 airspace above 12,500 feet MSL, excluding the airspace at or below

1- 1,500 feet MSL.
2- 2,500 feet MSL.
3- 1,500 feet AGL.
4- 2,500 feet AGL.

139. What are the minimum number of acceptable oxygen-dispensing units for first
E37 aid treatment of occupants who might require undiluted oxygen for physiological reasons?

1- Six
2- Four
3- Three
4- Two

140. What determines the minimum weather conditions that must exist for an air-
I24 port to be listed as an alternate airport for a domestic air carrier flight?

1- The sliding scale alternate airport weather minimums of 800-2, 900-1 1/2, or 1000-1, until 1 hour after the flight arrives at that airport.
2- The sliding scale alternate airport weather minimums of 800-2, 900-1 1/2, or 1000-1, when the flight arrives at that airport.
3- The alternate weather minimums listed in the certificate holder's operations specifications, when the flight arrives at the airport.
4- If the airport has only non-precision approaches, 600-2; if the airport has a precision approach, 800-2, when the flight arrives at that airport.

141. Which is an operational requirement regarding airplane interior emergency
E32 exit lights on passenger-carrying airplanes?

1- If the lights require arming to function automatically, they must be armed for taxi, takeoff, and landing operations.
2- Each light must provide the required level of illumination for at least 15 minutes at critical ambient temperatures after emergency landing.
3- Each light must have a completely self-contained battery power source.
4- Manual operation is required in addition to automatic operation in the event of interruption of the normal electrical generating power source.

142. The weather conditions must be at or above what minimum requirements for an
I24 airport to be listed as an alternate airport in the dispatcher release for a domestic air carrier flight?

1- Listed on the approach charts of that airport, at the time the flight is expected to arrive.
2- Specified in the certificate holder's operations specifications for that airport, when the flight arrives.
3- Specified in the certificate holder's operations specifications for that airport, from 1 hour before to 1 hour after the ETA for that flight.
4- Listed on the approach charts of that airport, from 2 hours before to 2 hours after the ETA for that flight.

143. You are given a priority clearance because of an in-flight emergency, and
D21 ATC requests a detailed report of the emergency. This report must be submitted within

1- 48 hours to the FAA Administrator.
2- 10 days to the Chief of the National Transportation Safety Board.
3- 48 hours to the nearest FAA district inspector.
4- 48 hours to the chief of that ATC facility.

144. What is the minimum recent instrument approach experience required, prior
B20 to the date of the practical test, to renew CAT II pilot authorization?

1- Within the previous 6 months, six ILS approaches, three of which may be flown to CAT I DHs by use of an approach coupler.
2- Within the previous 6 months, three ILS approaches flown by use of an approach coupler to CAT II DHs.
3- Within the previous 12 calendar months, six ILS approaches flown by use of an approach coupler to either CAT I or CAT II DHs.
4- Within the previous 12 months, six ILS approaches flown manually to CAT I DHs.

145. A domestic air carrier may list an airport as an alternate airport when
I24 the appropriate weather reports or forecasts, or any combination thereof, indicate that the weather conditions at that airport will be at or above

1- the alternate weather minimums listed in the certificate holder's operations specifications, when the flight arrives at the airport.
2- the sliding scale alternate airport weather minimums of 800-2, 900-1 1/2, or 1000-1, until 1 hour after the flight arrives at that airport.
3- 600-2 if the airport has a precision approach or 800-2 if it has only non-precision approaches when the flight arrives at that airport.
4- the sliding scale alternate airport weather minimums of 800-2, 900-1 1/2, or 1000-1, when the flight arrives at that airport.

146. What minimum ground visibility shall be used in lieu of a prescribed land-
D41 ing minimum of RVR 40 when that RVR requirement is not reported?

1- 3/8 statute mile
2- 5/8 statute mile
3- 3/4 statute mile
4- 7/8 statute mile

147. Which document is required to be carried aboard each flag air carrier
I74 flight conducted under FAR Part 121?

1- Flight release.
2- Dispatch release.
3- Weight and balance release.
4- Maintenance release.

148. A domestic air carrier has a seating capacity for 343 passengers. How many
E31 approved first aid kits must be provided for the treatment of minor injuries likely to occur in flight?

1- 6
2- 5
3- 4
4- 3

149. Which documents are required to be carried aboard each domestic air
I74 carrier flight conducted under FAR Part 121?

1- Load manifest and flight release.
2- Dispatch release and weight and balance release.
3- Dispatch release, load manifest, and flight plan.
4- Maintenance release, weight and balance release, and flight plan.

150. Each certificate holder operating a passenger-carrying airplane shall ensure
H26 that all passengers are orally briefed by an appropriate crewmember before each takeoff on the use of seatbelts,

1- location of life preservers, and rules for smoking.
2- location of emergency exits, and rules for smoking.
3- use of oxygen, location of emergency exits and life preservers, and rules for smoking.
4- location of emergency exits, and use of oxygen.

151. Which indication is within acceptable tolerances when checking a dual VOR
D17 installation using a VOT?

	VOR #1	TO/FROM	VOR #2	TO/FROM
1-	360°	TO	002°	TO
2-	180°	TO	182°	TO
3-	001°	FROM	005°	FROM
4-	180°	FROM	184°	FROM

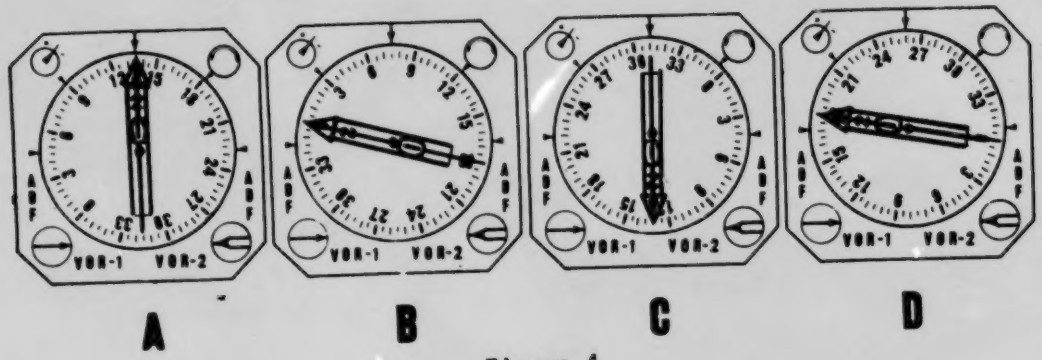


Figure 4

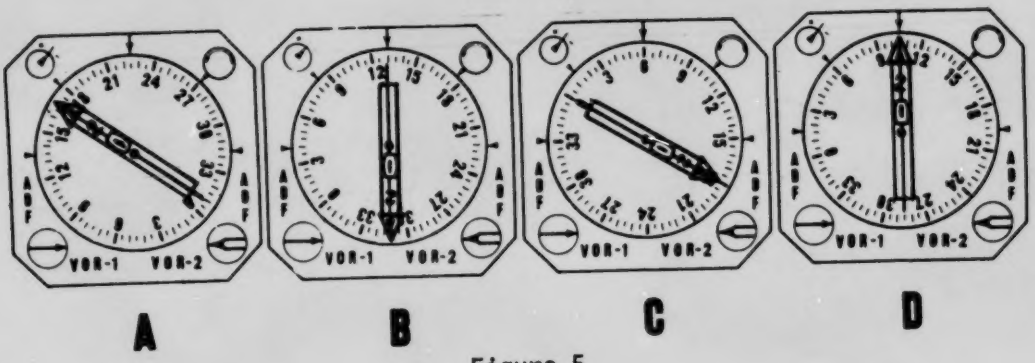


Figure 5

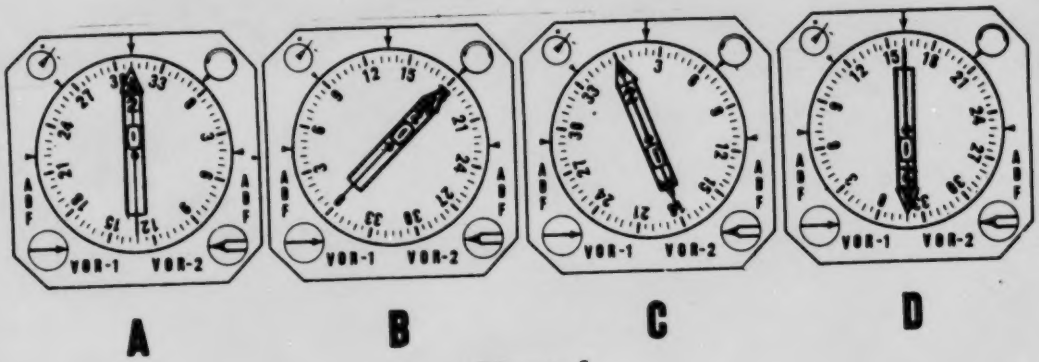


Figure 6

152. What operational requirement must be observed when ferrying a four-engine
D18 turbine powered domestic air carrier airplane from one facility to another to repair an inoperative engine?

1- The existing and forecast weather for departure, en route, and approach must be VFR.
2- The computed takeoff distance to reach V_1 must not exceed 70% of the effective runway length.
3- The gross weight at takeoff cannot exceed 65% of the maximum certificated gross takeoff weight.
4- No passengers can be carried; only the required flight crew may be on board the airplane.

153. To maintain route qualification, the pilot in command of a domestic air
F39 carrier must have made at least

1- one trip between terminals within the preceding 12 months.
2- one trip between terminals within the preceding 3 months.
3- one takeoff and landing at each regular, provisional, and refueling airport within the preceding 6 months.
4- two round trips between terminals within the preceding 12 months.

154. The prescribed landing minimum for a particular instrument approach procedure
D41 is RVR 40. What minimum ground visibility shall be used in lieu of the RVR requirement?

1- 7/8 statute mile
2- 3/4 statute mile
3- 5/8 statute mile
4- 3/8 statute mile

155. When dual independent VOR receivers are installed in an airplane (except for the
D17 antenna), what is the maximum acceptable variation between the bearing indicators when checking the receivers using a VOT?

	VOR #1	TO/FROM	VOR #2	TO/FROM
1-	180°	FROM	184°	FROM
2-	360°	TO	002°	TO
3-	180°	TO	184°	TO
4-	001°	FROM	005°	FROM

156. May flight crewmembers on flight deck duty leave their stations during
H14 cruising flight?

1- Yes, to perform duties in connection with aircraft operation.
2- No, unless there is a relief crewmember to take their place.
3- Yes, if there is one pilot and the flight engineer on duty.
4- Only in case of an emergency.

157. Under which conditions are two persons permitted to share one safety belt in
E33 a lounge seat?

1- When one is an adult and one is a child under 3 years of age.
2- Only during the en route portion of a flight.
3- During all operations except turbulent air penetration.
4- During all operations except the landing portion of a flight.

158. To perform duties associated with the handling of dangerous articles and
F31 magnetized materials, a crewmember must have completed an established training program within the preceding

1- 24 months.
2- 18 calendar months.
3- 12 calendar months.
4- 6 months.

159. Which instrument indicates that both VOR navigation systems are within accepted
D17 tolerances during a VOT check? (Fig. 4)

1- D
2- C
3- B
4- A

160. Which instrument indicates that both VOR navigation systems are within accepted
D17 tolerances during a VOT check? (Fig. 5)

1- D
2- C
3- B
4- A

161. Which instrument indicates that both VOR navigation systems are within accepted
D17 tolerances during a VOT check? (Fig. 6)

1- D
2- C
3- B
4- A

162. Which is the correct symbol for the stalling speed or the minimum steady
A20 flight speed at which the airplane is controllable?

1- V_{SO}
2- V_2
3- V_S
4- V_{S1}

163. A flight crew of two pilots originally scheduled out on a domestic air carrier
G10 flight was delayed on the inbound flight and now has 5 1/2 hours of duty aloft within the preceding 24 hours. This crew can be dispatched

1- without rest, provided the estimated time en route is not more than 2 1/2 hours.
2- only after 11 hours of rest.
3- after 8 hours of rest only, provided the estimated time en route is not more than 2 1/2 hours.
4- only after 16 hours of rest.

164. The forecast weather conditions for a particular destination and alternate
I21 airport are considered marginal for a domestic air carrier's operation. What specific action should you take?

1- Delay the flight, not to exceed 1 hour, for possible weather improvement.
2- Add one additional hour of fuel based on cruise power settings for the airplane in use.
3- Reroute the flight along a different route if better weather conditions exist.
4- List at least one additional alternate airport.

165. What is the minimum recent instrument approach experience required, prior
B20 to the date of the practical test, to renew CAT II pilot authorization?

1- Within the previous 6 months, six ILS approaches, three of which may be flown to CAT I DHs by use of an approach coupler.
2- Within the previous 6 months, six ILS approaches flown by use of an approach coupler to CAT I DHs.
3- Within the previous 12 calendar months, three ILS approaches flown by use of an approach coupler to CAT II DHs.
4- Within the previous 12 months, six ILS approaches flown manually to CAT I DHs.

166. Which inflight conditions are required for a domestic air carrier to conduct a
I50 day, over-the-top, flight below the specified IFR minimum en route altitude?

1- The flight must be conducted at least 1,000 feet above an overcast or broken cloud layer and have at least 5 miles flight visibility.
2- The flight must remain clear of any clouds by at least 500 feet vertically and 1,000 feet horizontally and have at least 3 miles flight visibility.
3- The flight must be conducted at least 2,000 feet above and 1,000 feet below any overcast or broken cloud layer and have at least 5 miles flight visibility.
4- The height of any higher overcast or broken layer must be at least 500 feet above the IFR MEA.

167. IFR altitudes or flight levels assigned by ATC normally conform to the hemi-
D44 spheric rule. Which of the following groups contain altitudes or flight levels appropriate for an eastbound IFR flight in uncontrolled airspace?

1- 7,500, 9,500, FL 295, FL 315.
2- 7,000, 9,000, FL 290, FL 330.
3- 6,500, 8,500, FL 285, FL 315.
4- 6,000, 8,000, FL 280, FL 310.

168. What is the maximum number of hours you may fly in 7 consecutive days as pilot
G20 in command of a two-pilot crew for a flag air carrier?

1- 35 hours
2- 32 hours
3- 30 hours
4- 28 hours

169. Unless waived by the Administrator, when only one battery-powered megaphone is
E31 required, where must it be located within the passenger cabin on a flag passenger-carrying airplane?

1- The most accessible location in the forward portion of the passenger cabin.
2- As close as practicable to the midsection or the overwing exit.
3- The most rearward location readily accessible to a normal flight attendant seat.
4- On the flight deck readily accessible to any crewmember.

170. A commercial pilot has a DC-3 type rating and successfully completes a B32 flight test for the Airline Transport Pilot Certificate in a Boeing 737. Instruction may be given by this pilot in air transportation service in

1- any airplane in which a rating is held, provided a Flight Instructor Certificate is held.
2- the Boeing 737 only, unless a Flight Instructor Certificate is also held.
3- both the DC-3 and Boeing 737.
4- any airplane, provided the student is training for an Airline Transport Pilot Certificate.

171. In addition to fully equipped liferafts and life preservers, what emergency E38 equipment must be provided on an air carrier airplane during extended over-water operations?

1- One survival kit for each 25 occupants.
2- One self-buoyant, water resistant, portable emergency radio transceiver for each 10 occupants.
3- One pyrotechnic signaling device for each 10 occupants.
4- One survival-type emergency locator transmitter.

172. What in-flight visibility is required when flying more than 1,200 feet AGL D30 (but less than 10,000 feet MSL) in VFR conditions in controlled airspace?

1- 3 miles
2- 2 miles
3- 1 mile
4- One-half statute mile

173. A flag air carrier flight is dispatched to an airport within the I43 48 contiguous states for which an alternate airport is available. What minimum amount of fuel is required after reaching the alternate airport?

1- Two hours at normal cruising fuel consumption.
2- Enough fuel to return to the destination airport.
3- Ten percent of the time to fly from the departure airport to the destination airport.
4- Forty-five minutes at normal cruising fuel consumption.

174. In addition to the required trip fuel, which factor is used when computing I44 fuel requirements for all operations?

1- Enough fuel for one instrument approach and possible missed approach at destination.
2- Forty-five minutes of reserve fuel computed at normal cruise fuel flow at 10,000 feet.
3- Thirty minutes reserve computed at normal cruise fuel flow.
4- Additional fuel for unanticipated traffic delays and two missed approaches.

175. Which certificated air carrier must prepare a load manifest containing I71 names of passengers?

1- Commercial air carriers only.
2- Supplemental and commercial air carriers.
3- Flag air carriers only.
4- Domestic and flag air carriers.

176. Which equipment requirement must be met by an air carrier that uses an Inertial I91 Navigation System (INS) on a proposed flight?

1- Dual ILS systems with an operative Flight Director System can be substituted for one inoperative INS.
2- Both INS systems must be operational.
3- A dual VORTAC/ILS system may be substituted for an inoperative INS.
4- Only one INS is required if an operative Doppler Radar can be substituted for the other INS.

177. If a scheduled flight in a four-engine domestic air carrier airplane requires I20 a departure alternate airport, what is the greatest distance in flying time it may be located from the departure airport at normal cruising speed in still air?

1- Two hours, with one engine inoperative.
2- One hour, with all engines operative.
3- Two hours, with all engines operative.
4- One hour, with two engines inoperative.

178. An air carrier airplane had a brake failure during landing. After
I77 repairs have been made, the airworthiness release is the responsibility of the

1- certificate holder.
2- flight engineer.
3- pilot in command.
4- chief aircraft dispatcher.

179. For which of these aircraft is the "clearway" for a particular runway
E15 considered in computing takeoff weignt limitations?

1- Large aircraft (more than 12,500 pounds).
2- Passenger-carrying transport aircraft.
3- U.S. certificated air carrier airplanes.
4- Turbine-engine powered transport airplanes.

180. A domestic flight crew is scheduled for 10 hours of duty aloft within 24 consec-
G10 utive hours. The inbound flight took 5 hours; the outbound flight is scheduled for 5 hours. What is the minimum crew rest period required after the inbound flight before the same flight crew can be redispatched for the outbound flight?

1- 16 hours
2- 10 hours
3- 8 hours
4- 5 hours

181. While in uncontrolled airspace in VFR conditions, what distance from clouds
D30 should be maintained when flying more than 1,200 feet AGL, and at or above 10,000 feet MSL?

1- 500 feet below; 1,000 feet above; 1 statute mile horizontal.
2- 1,000 feet below; 500 feet above; 2,000 feet horizontal.
3- 1,000 feet below; 1,000 feet above; 1 statute mile horizontal.
4- 500 feet below; 1,000 feet above; 2,000 feet horizontal.

182. Which information must be contained in, or attached to, the dispatch release
I70 for a domestic air carrier flight?

1- A statement of the type of operation (e.g., IFR or VFR).
2- Total fuel supply on board the airplane.
3- Passenger manifest, cargo load, and weight and balance data.
4- Name of each flight crewmember.

183. When a required item of aircraft equipment becomes inoperative, which docu-
I25 ment contains the approved procedures for dispatch or continuing flight?

1- Minimum Equipment List.
2- Amended flight/dispatch release.
3- Original dispatch release.
4- Operations Specifications.

184. If a flag air carrier aircraft has a seating capacity of 153, how many
E31 approved first aid kits must be provided for the treatment of injuries likely to occur in flight?

1- 2
2- 3
3- 4
4- 5

185. What are the IFR takeoff minimums for supplemental air carriers?
I47

1- As printed on the approach chart for that runway.
2- As printed on IFR takeoff and departure procedures.
3- One-half statute mile--aircraft having more than two engines.
4- As specified in the operations specifications.

186. To utilize an approved visual simulator to reestablish recency of experience
F34 for takeoffs and landings, what minimum number of flight hours must have been previously logged in the same type airplane in which a pilot will serve?

1- 50 hours
2- 75 hours
3- 90 hours
4- 100 hours

187. A domestic air carrier shall keep copies of the flight plans, dispatch releases,
I74 and load manifests for at least

1- 6 months.
2- 3 months.
3- 45 days.
4- 30 days.

188. During takeoff and landing, which use of seat belts is approved in the passenger compartment of a flag air carrier airplane?
E33

1- Each person, regardless of age, must occupy a single seat with an approved safety belt.
2- Two persons, one of which is under two years of age, may occupy one seat and share one approved safety belt.
3- Two persons, regardless of age, may occupy a berth and share one approved safety belt.
4- Persons who have reached their second birthday, may occupy a divan when individual safety belts are provided.

189. Within which minimum preceding time period must a pilot have made three takeoffs and landings in the airplane of the type in which the pilot is to serve as pilot in command?
F34

1- 180 days
2- 90 days
3- 45 days
4- 30 days

190. During which operations must the automatic deploying escape slides be armed on a passenger carrying landplane which is certificated with this system?
E32

1- Anytime an emergency condition exists.
2- During takeoff and landing only.
3- During taxi, takeoff, and landing.
4- During taxi and takeoff only.

191. A pilot has had certain experience with the make and basic model of flight control guidance system used in CAT II operations. What recent experience is required for a pilot to serve as pilot in command during a CAT II instrument approach?
B20

1- Six ILS approaches within the preceding 6 months.
2- Three ILS approaches within the preceding 6 months.
3- Six ILS approaches within the preceding 12 months.
4- Twelve ILS approaches within the preceding 6 months.

192. A three-engine air carrier airplane is on the ground at an airport where the weather has deteriorated so that it is below the air carrier's landing minimums for that airport. The airplane may be dispatched from that airport when an alternate airport is located not more than
I20

1- 2 hours from the departure airport at normal cruising speed in still air with one engine inoperative.
2- 1 hour from the departure airport at normal cruising speed.
3- 2 hours from the departure airport at normal cruising speed under the most adverse wind conditions forecast during that period.
4- 1 hour from the departure airport at normal cruising speed in still air with one engine inoperative.

193. While in uncontrolled airspace in VFR conditions, what distance from clouds should be maintained when flying more than 1,200 feet AGL and below 10,000 feet MSL?
D30

1- 500 feet below; 1,000 feet above; 1 statute mile horizontal.
2- 1,000 feet below; 500 feet above; 2,000 feet horizontal.
3- 500 feet below; 1,000 feet above; 2,000 feet horizontal.
4- 1,000 feet below; 1,000 feet above; 1 statute mile horizontal.

194. What altitudes or flight levels would be appropriate for an eastbound IFR flight in uncontrolled airspace?
D44

1- FL 215, FL 195, 15,500, and 17,500.
2- FL 210, FL 190, 15,000, and 17,000.
3- FL 200, FL 220, 16,000, and 12,000.
4- 15,500, 11,500, 9,500, and 7,500.

195. What is the number of approved first aid kits required for treatment of inflight injuries or minor accidents for an air carrier airplane with a seating capacity for 287 passengers?
E31

1- 3
2- 4
3- 6
4- 8

196. To maintain route qualification, the pilot in command of a flag air carrier
F39 airplane must have made at least

1- two round trips between terminals within the preceding 12 months.
2- one takeoff and landing at each regular, provisional, and refueling airport within the preceding 6 months.
3- one trip between terminals within the preceding 3 months.
4- one trip between terminals within the preceding 12 months.

197. While in controlled airspace in VFR conditions, what in-flight visibility
D30 is required when flying more than 1,200 feet AGL, but less than 10,000 feet MSL?

1- 5 statute miles
2- 3 statute miles
3- 2 statute miles
4- 1 statute mile

198. At 1345Z, a flag air carrier flight lands at an intermediate airport. If
I11 the flight experiences a delay, what is the latest time it may depart for the destination airport without a redispatch release?

1- 1945Z
2- 1545Z
3- 1445Z
4- 1415Z

199. If weather conditions at the departure airport are below the landing minimums
I20 in the operations specifications for that airport, what is the maximum distance specified for an alternate airport for airplanes having four engines?

1- One hour at normal cruise speed in still air with one engine inoperative.
2- Two hours at normal cruise speed in still air with all engines operating.
3- Two hours at normal cruise speed in still air with one engine inoperative.
4- One hour at normal cruise speed in still air with all engines operating.

200. What additional certification, if any, is issued to crewmembers on an air
I80 carrier of U.S. registry engaged in international air commerce to facilitate entry and clearance into ICAO contracting states?

1- Appropriate certification procedures must be followed in each country.
2- A "Crewmember Certificate" issued by the Federal Aviation Administration.
3- An ICAO International Crewmember Certificate issued by ICAO.
4- None, if flights are made into ICAO member nations.

201. What altitudes or flight levels would be appropriate for an eastbound IFR flight
D44 in uncontrolled airspace below the PCA?

1- 15,000, 11,000, 9,000 and 7,000.
2- 15,500, 11,500, 9,500 and 7,500.
3- FL 215, FL 195, 15,500 and 17,500.
4- FL 210, FL 190, 15,000 and 17,000.

202. Each certificate holder operating a passenger-carrying airplane shall
H26 ensure that all passengers are orally briefed by the appropriate crewmember before each takeoff on

1- smoking, use of seat belts, and location of emergency exits.
2- use of seat belts, oxygen, and life preservers.
3- use of oxygen, location of emergency exits, and life preservers.
4- location of emergency exits, oxygen masks, and liferafts.

203. At 1805Z, a flag air carrier flight lands at an intermediate airport. If
I11 the flight experiences a delay for maintenance, what is the latest time it may depart for the destination airport without a redispatch release?

1- 0005Z
2- 2005Z
3- 1905Z
4- 1850Z

204. For what minimum period of time shall a flag air carrier keep copies of the load
I74 manifest?

1- 6 months
2- 3 months
3- 45 days
4- 30 days

205. To utilize an approved visual simulator to reestablish recency of
F34 experience for takeoffs and landings, what minimum number of flight hours must have been previously logged in the same type airplane in which a pilot will serve?

1- 200 hours
2- 175 hours
3- 100 hours
4- 50 hours

206. How many approved first aid kits for treatment of injuries likely
E31 to occur in flight must be evenly distributed throughout a domestic air carrier aircraft which has a seating capacity of 267?

1- 5
2- 4
3- 3
4- 2

207. During CAT II operations, what additional ground equipment is
D12 required when the RVR for the TDZ is reported as less than 1,600 feet?

1- Touchdown Zone Lighting (TDZL).
2- Runway Centerline Lighting.
3- An operative runway visual range system in the rollout zone.
4- Runway remaining lights (amber) for the final 2,000 feet must be operating.

208. FAR Part 1 defines V_S as the stalling speed or minimum steady flight speed
A20

1- with the critical engine inoperative.
2- in the landing configuration.
3- obtained in a specified configuration.
4- at which the airplane is controllable.

209. What is the minimum fuel required by a flag air carrier turbojet powered air-
I43 plane, on a flight within the 48 contiguous states and the District of Columbia, after reaching the most distant alternate airport?

1- Forty-five minutes at normal cruising fuel consumption.
2- Ten percent of the time required from the departure airport to the alternate airport.
3- Two hours at normal cruising fuel consumption.
4- Enough fuel to return to the destination airport.

210. The document which contains the approved procedures for continuing a proposed
I25 flight when an item of required airplane equipment becomes inoperative is the

1- amended flight release.
2- Operations Specifications.
3- Minimum Equipment List.
4- original dispatch release.

211. If an item of required airplane equipment becomes inoperative, which docu-
I25 ment contains the approved procedures for dispatching or continuing a proposed flight?

1- Operations Specifications.
2- Minimum Equipment List.
3- Amended flight/dispatch release.
4- Original dispatch release.

212. A commercial pilot has a type rating in a B-727 and DC-3. A flight test is
B33 completed in a B-747 for the Airline Transport Pilot Certificate. What pilot privileges may be exercised regarding these airplanes?

1- ATP - B-747, B-727, and DC-3.
2- Commercial - DC-3; ATP - DC-10 and B-747.
3- Commercial - B-727 and DC-3; ATP - B-747.
4- Commercial - DC-9; ATP - B-747 and DC-3.

213. For flights scheduled above what flight level shall a crewmember instruct
E37 passengers on the use of supplemental oxygen?

1- FL 350
2- FL 330
3- FL 290
4- FL 250

214. Which certificated air carrier operators must attach to, or include on, the
I71 flight release form the name of each flight crewmember, flight attendant, and designated pilot in command?

1- Supplemental only.
2- Flag and Commercial.
3- Supplemental and Commercial.
4- Domestic.

215. Which certificated air carrier must list names of passengers on a load manifest?
I71

1- Domestic and flag air carriers.
2- Flag air carriers only.
3- Commercial air carriers only.
4- Supplemental and commercial air carriers.

216. For IFR operations within the 48 contiguous states and the District of
I23 Columbia, supplemental air carriers and commercial operators are required to list an alternate airport for each destination airport

1- regardless of the reported and forecast weather conditions.
2- only when the forecast ceiling and visibility are less than 5,000 and 5, from 2 hours before to 2 hours after the ETA.
3- only when the forecast ceiling is less than 1,000 feet above the MEA, MOCA, or initial approach altitude, or forecast visibility is less than 3 miles from 2 hours before to 2 hours after the ETA.
4- only when the forecast ceiling and visibility are less than 3,000 and 3, from 2 hours before to 2 hours after the ETA.

217. A domestic air carrier schedules a two-pilot crew for two flights within 24
G10 consecutive hours. The first flight takes 6 hours and the second flight is scheduled for 4 hours. Prior to the second flight, the flight crewmembers must be given a rest period of at least

1- 12 hours.
2- 10 hours.
3- 8 hours.
4- 4 hours.

218. What is the maximum flight time a flag air carrier may schedule you to fly as
G20 pilot of a two-pilot crew without a rest period?

1- 6 hours
2- 8 hours
3- 10 hours
4- 12 hours

219. A flag air carrier flight which requires three pilots is scheduled to operate on
B12 August 5. Each of the pilots has a First-Class Medical Certificate dated January 28 of the same year. For this scheduled flight

1- all three pilots must have new medical certificates prior to departure.
2- only the pilot serving as pilot in command must have a new medical certificate prior to departure.
3- only the pilots serving as pilot in command and second in command must have new medical certificates prior to departure.
4- these medical certificates are adequate for each of the pilot positions.

220. When is a supplemental air carrier required to list an alternate airport
I23 for each destination airport for operations within the contiguous states and the District of Columbia?

1- Only when the forecast ceiling is less than 3,000 feet and visibility less than 3 miles for ETA plus or minus 2 hours.
2- An alternate airport is required regardless of existing or forecast weather conditions.
3- Only when the ceiling is forecast to be less than 5,000 feet and visibility less than 5 miles for the ETA plus or minus 1 hour.
4- Only when weather conditions are forecast to be below basic VFR minimums.

221. During what preceding time period must a crewmember have completed an established
F31 training program in order to perform duties associated with the handling and carriage of dangerous articles and magnetized materials?

1- 6 months
2- 24 months
3- 12 calendar months
4- 18 calendar months

222. Your flight logbook for the months of July and August shows these entries:
G10

July 28 - 2.0 hrs. - air carrier flight
July 29 - 3.0 hrs. - air carrier flight
July 30 - 3.0 hrs. - air carrier flight
Aug. 1 - 8.0 hrs. - charter flight
Aug. 2 - 4.0 hrs. - flight instruction
Aug. 4 - 4.0 hrs. - pleasure flight
Aug. 5 - 6.0 hrs. - air carrier flight

How many additional hours, if any, can you fly for this domestic air carrier on August 6 without exceeding the maximum flight time authorized in any 7 consecutive days?

1- None
2- 5 additional hours
3- 9 additional hours
4- 12 additional hours

223. At which altitudes or flight levels is an approved DME receiver required
E42 on a domestic air carrier, three engine turbojet operating along victor or jet airways?

1- At all operating altitudes or flight levels.
2- Only for operations above FL 180.
3- Only for operations between FL 240 and FL 450.
4- For operations in positive controlled airspace only.

224. What are the certificate and rating requirements for a pilot second in
F33 command of a three pilot crew on a four-engine turbojet domestic air carrier airplane?

1- Commercial Pilot Certificate with instrument rating.
2- Airline Transport Pilot Certificate with airplane type rating.
3- Flight Engineer Certificate and Commercial Pilot Certificate with airplane type rating.
4- Commercial Pilot Certificate with instrument and airplane type ratings.

225. A flag air carrier flight requires three pilots. What are the certifi-
F33 cate and rating requirements for the third pilot?

1- Airline transport pilot with airplane type rating.
2- Commercial pilot with instrument rating only.
3- Commercial pilot with category, class, and instrument ratings.
4- Commercial pilot with airplane type and instrument rating.

226. While in uncontrolled airspace in VFR conditions, what distance from clouds
D30 should be maintained when flying at 8,500 feet MSL but more than 1,200 feet AGL?

1- 1,000 feet below; 1,000 feet above; 1 mile horizontal.
2- 500 feet below; 500 feet above; 1,000 feet horizontal.
3- 1,000 feet below; 500 feet above; 2,000 feet horizontal.
4- 500 feet below; 1,000 feet above; 2,000 feet horizontal.

227. Which is a correct definition of an airplane speed symbol?
A20

1- V_{MA} - design maximum maneuvering speed.
2- V_C - design speed for maximum cruise.
3- V_{FE} - maximum speed for extending wing flaps.
4- V_{LO} - maximum landing gear operating speed.

228. What is the maximum distance a departure alternate airport may be located from
I20 the departure airport for a three-engine turbine powered airplane?

1- Two hours at normal cruise speed in still air with one engine inoperative.
2- One hour at normal cruise speed in still air with one engine inoperative.
3- Two hours at slow cruise speed in still air with one engine inoperative.
4- One hour at slow cruise speed in still air with one engine inoperative.

229. Under what condition may a pilot of a domestic air carrier complete an
I46 instrument approach procedure to the DH, if the reported weather conditions are less than the prescribed minimums for that airport?

1- If the pilot specifically requests and is cleared for a radar monitored ILS approach.
2- If the weather report indicating below minimum conditions is received after the pilot has been cleared for a PAR or ILS approach.
3- When the weather report indicating below minimum conditions is received after the pilot has passed the OM on an ILS approach.
4- When the airport is served by an operative ILS or PAR and one is used by the pilot.

230. A domestic air carrier schedules a two-pilot crew for two flights within
G20 24 consecutive hours. The first flight took 5 hours and the second flight is scheduled for 4 hours. Prior to the second flight, the flight crewmembers must be given a rest period of at least

1- 5 hours.
2- 8 hours.
3- 10 hours.
4- 12 hours.

231. During a CAT II approach to a DH of 150 feet, for which marker beacons
D12 may a compass locator or precision radar be substituted?

1- No substitutions are authorized for CAT II approaches.
2- OM and MM.
3- OM only.
4- OM, MM, and IM.

232. A flight requiring two pilots is scheduled for August 1. Both the
B12 pilot in command and the second in command have a First-Class Medical Certificate dated February 28. Prior to the scheduled flight, the pilot in command

1- and second in command hold certificates adequate for the flight.
2- must obtain a new First-Class Medical Certificate; the second in command must have a new medical certificate, but a second class certificate is adequate.
3- must obtain a new First-Class Medical Certificate; the second in command's certificate is adequate.
4- and second in command must obtain new First-Class Medical Certificates.

233. For flights with cabin pressure altitudes above 15,000 feet, the passenger oxygen
E36 supply required is enough for

1- each passenger for 30 minutes.
2- 10% of the passengers for the entire flight at those altitudes.
3- each passenger during the entire flight at those altitudes.
4- 30% of the passengers for 30 minutes.

234. Which inflight conditions are required by a supplemental air carrier to conduct
I50 a day, over-the-top, flight below the specified IFR minimum en route altitude?

1- The flight must remain clear of clouds by at least 500 feet vertically and 1,000 feet horizontally and have at least 3 miles flight visibility.
2- The flight must be conducted at least 1,000 feet above an overcast or broken cloud layer and have at least 5 miles flight visibility.
3- The height of any higher overcast or broken layer must be at least 500 feet above the IFR MEA.
4- The flight must be conducted at least 2,000 feet above and 1,000 feet below any overcast or broken cloud layer and have at least 5 miles flight visibility.

235. When is a commercial operator required to list an alternate airport for each
I23 destination airport for operations within the contiguous states and the District of Columbia?

1- Only when weather conditions are forecast to be below basic VFR minimums.
2- Only when the forecast ceiling is less than 5,000 feet and visibility less than 5 miles for the ETA plus or minus 2 hours.
3- An alternate airport is required regardless of forecast or reported weather conditions.
4- Only when the forecast ceiling is less than 3,000 feet and visibility less than 3 miles for the ETA plus or minus 2 hours.

236. Which factor is used when computing fuel requirements for all domestic air
I44 carrier operations?

1- Enough fuel for flight to destination airport, plus 30 minutes reserve computed at normal cruise fuel flow.
2- Additional fuel for unanticipated traffic delays and two missed approaches.
3- Enough fuel to land at destination airport, plus 45 minutes of reserve fuel computed at normal cruise fuel flow at 10,000 feet.
4- In addition to planned trip fuel, enough fuel for one instrument approach and possible missed approach at destination.

237. What are the certificate and rating requirements for a pilot second in
F33 command of a two-pilot crew on a three-engine turbojet domestic air carrier airplane?

1- Airline Transport Pilot Certificate with airplane type rating.
2- Commercial pilot with category, class, and instrument ratings.
3- Flight Engineer Certificate and Commercial Pilot Certificate with airplane type rating.
4- Commercial Pilot Certificate with instrument and airplane type ratings.

238. When a departure alternate is required for a Boeing 727 domestic air carrier
I20 flight, it must be located at a distance not greater than

1- 2 hours from the departure airport at normal cruising speed in still air with one engine inoperative.
2- 1 hour from the departure airport at normal cruising speed in still air with one engine inoperative.
3- 2 hours from the departure airport at normal cruising speed in still air.
4- 1 hour from the departure airport at normal cruising speed in still air.

239. The minimum certificate and rating requirements for the second in
F33 command of the two-pilot crew on a two-engine domestic air carrier turbojet airplane are

1- Airline Transport Pilot Certificate with aircraft type rating.
2- Flight Engineer Certificate and Commercial Pilot Certificate with aircraft type rating.
3- Commercial Pilot Certificate with instrument and aircraft type ratings.
4- Commercial Pilot Certificate with instrument rating.

240. Which takeoff computation must not be longer than the runway length for a
E15 domestic air carrier transport category airplane?

1- Accelerate-stop distance
2- Takeoff path
3- Takeoff run
4- Takeoff distance

241. Which information must be contained in, or attached to, the dispatch release for
I70 a domestic air carrier flight?

1- Weight and balance data.
2- Total fuel supply on board the airplane.
3- Type of operation (e.g., IFR, VFR).
4- Passenger manifest and cargo weight.

242. What is the minimum operative equipment a passenger-carrying turbojet airplane
E42 operating under FAR Part 121 must have installed when operating under IFR in the conterminous United States?

1- Two DMEs, two LF navigation receivers, and airborne weather radar.
2- One DME, two independent VOR receivers, and airborne weather radar.
3- One DME, one VOR receiver, and Doppler radar may be substituted for weather radar.
4- One DME and two independent navigation receivers.

243. What emergency equipment is required for an extended over-water operation
E38 for a supplemental air carrier flight?

1- An appropriately equipped survival kit attached to each required liferaft.
2- A self-buoyant, water resistant, portable radio for each required liferaft.
3- Enough liferafts to accommodate the full seating capacity of the airplane.
4- A life preserver or other flotation device for the full seating capacity of the airplane.

244. What is the maximum number of hours that a pilot, not qualified to act as pilot in
G10 command, may fly as a crewmember in a domestic air carrier service?

1- 120 hours in any 30 consecutive days and 1,200 hours in any 12 consecutive months.
2- 120 hours in any calendar month and 1,000 hours in any calendar year.
3- 100 hours in any 30 consecutive days and 1,200 hours in any 12 consecutive months.
4- 100 hours in any calendar month and 1,000 hours in any calendar year.

245. The second in command of a two-pilot domestic air carrier flight may log as
B13 instrument flight time

1- 100% of the time the pilot is controlling the airplane solely by reference to flight instruments.
2- 50% of the time the airplane is in actual IFR conditions.
3- 50% of the time the flight is on an IFR flight plan.
4- 100% of the time the airplane is in actual IFR conditions or the pilot is wearing a view-limiting device.

246. A refueling airport within the continental United States has no prescribed
I34 takeoff minimums. What minimum weather conditions must exist at takeoff if this airport is not listed in the air carrier's specifications?

1- 1000-2
2- 1000-3
3- 900-2
4- 800-2

247. If your flight is advised that pilot reports indicate icing conditions which
I26 might adversely affect the safety of flight, the operations

1- may be continued only if all anti-icing and deicing equipment is operating normally.
2- shall not be continued except by joint approval of the dispatcher and ATC.
3- shall not be continued or a landing made in such icing conditions.
4- may be continued, but a landing shall not be made in such icing conditions.

248. Each domestic air carrier is required to carry aboard each airplane to the
I74 destination airport a copy of the

1- weight and balance release and flight plan.
2- load manifest and dispatch release.
3- dispatch release, load manifest, and flight plan.
4- dispatch release, and weight and balance release.

249. Which emergency equipment is required for a flag air carrier flight between
E38 JFK International and London, England?

1- Enough liferafts to accommodate the full seating capacity of the airplane.
2- A life preserver or other flotation device for the full seating capacity of the airplane.
3- An appropriately equipped survival kit attached to each required liferaft.
4- A self-buoyant, water resistant portable radio for each required liferaft.

250. What is the minimum RVR value in the touchdown zone before a rollout zone
D12 RVR system is required during CAT II operations?

1- RVR 10
2- RVR 12
3- RVR 14
4- RVR 16

251. The reported weather conditions are less than the prescribed minimums for an
I46 airport. As a pilot for a domestic air carrier, under which condition may you continue an instrument approach procedure to the MDA or DH?

1- When the airport is served by operative ILS and PAR and either is used for the approach.
2- If the weather report indicating below landing minimums is received after you have passed the OM on an ILS approach.
3- If you specifically requested and were cleared for a radar monitored ILS approach.
4- If the weather report indicating below landing minimum conditions is received after you have received ATC clearance for the approach.

252. According to FAR Part 121, the cockpit voice recorder must operate continuously
E44 from the start of

1- the before starting engine checklist to the final checklist upon termination of flight.
2- the takeoff roll to completion of the landing roll.
3- taxiing from the loading ramp to block-in after flight.
4- the before starting engine checklist to completion of the landing roll.

253. Which information must be contained in, or attached to, the dispatch release
I70 for a domestic air carrier flight?

1- Departure airport, intermediate stops, destination and alternate airports.
2- Name of each flight crewmember.
3- Total fuel supply on board the airplane.
4- Passenger manifest, cargo load, and weight and balance data.

254. A domestic air carrier flight lands at 2315Z at an intermediate airport speci-
I10 fied in the dispatch release. What is the latest time it may depart the intermediate airport without a redispatch release?

1- 0515Z
2- 0015Z
3- 0000Z
4- 2345Z

255. What is the passenger oxygen supply requirement for flights with a cabin
E36 pressure altitude in excess of 15,000 feet? Enough oxygen for

1- each passenger for 30 minutes.
2- 10% of the seating capacity at those altitudes.
3- 50% of the actual passenger load for 30 minutes.
4- all passengers for the entire flight duration above 15,000 feet cabin altitude.

256. Which amount of data may be erased for the purpose of testing a flight recorder
E40 system which has the erasure feature?

1- Any amount of data may be erased.
2- Not more than 30 minutes of prerecorded data.
3- Not more than a total of 1 hour of the oldest recorded data accumulated at the time of testing.
4- Not more than a total of 2 hours of the oldest recorded data accumulated prior to testing the system.

257. While in controlled airspace in VFR conditions, what in-flight visibility
D30 is required when flying more than 1,200 feet AGL, and at or above 10,000 feet MSL?

1- 5 statute miles
2- 3 statute miles
3- 2 statute miles
4- 1 statute mile

258. Excluding airspace at and below 2,500 feet AGL, above which altitude in con-
D16 trolled airspace of the 48 contiguous states and the District of Columbia is an appropriately equipped transponder required?

1- 12,500 feet AGL
2- 12,500 feet MSL
3- 14,500 feet AGL
4- 14,500 feet MSL

259. What information must be contained in the load manifest for a flag air
I72 carrier?

1- CG position at takeoff.
2- Maximum allowable weight for the flight.
3- Passenger manifest.
4- Distribution of cargo.

260. Your flight logbook for the months of March and April show these entries:
G10

Mar. 28 - 2.0 hrs. - air carrier flight
Mar. 29 - 3.0 hrs. - air carrier flight
Mar. 30 - 3.0 hrs. - air carrier flight
April 1 - 8.0 hrs. - charter flight
April 2 - 4.0 hrs. - flight instruction
April 4 - 4.0 hrs. - pleasure flight
April 5 - 6.0 hrs. - air carrier flight

How many additional hours, if any, can you fly for this domestic air carrier on April 6 without exceeding the maximum flight time authorized in any 7-consecutive days?

1- 12 hours
2- 9 hours
3- 5 hours
4- None

261. Which certificated air carrier operators must attach to, or include on, the
I71 flight release form the name of each flight crewmember?

1- Domestic and Flag.
2- Supplemental and Domestic.
3- Flag and Commercial.
4- Supplemental and Commercial.

262. For CAT II approaches to a DH below 150 feet, what airplane equipment is
D50 required in addition to the basic equipment required for CAT II operations?

1- A marker beacon receiver providing aural and visual indications of the inner marker.
2- A radio altimeter which displays the actual height of the flight deck above the terrain.
3- A third gyroscopic pitch-and-bank indicating system.
4- Dual glide slope and localizer receiving antennas.

263. What is the maximum time a domestic flight may remain on the ground after
I10 landing at an intermediate airport specified in the dispatch release before a redispatch release is required for the destination airport?

1- 6 hours
2- 3 hours
3- 1 hour
4- 30 minutes

264. At 1815Z, a domestic air carrier flight lands at an intermediate airport speci-
I10 fied in the dispatch release. If the flight is delayed, what is the latest time it may depart the intermediate airport without a redispatch release?

1- 2015Z
2- 1945Z
3- 1915Z
4- 1845Z

265. For an extended overwater operation, which equipment is required?
E38

1- A survival kit for each occupant.
2- One portable emergency radio signaling device.
3- One pyrotechnic signaling device for each lifevest.
4- Enough liferafts to accommodate the occupants of the airplane.

266. The number of approved first-aid kits required for treatment of
E31 injuries likely to occur in flight is predicated on seating capacity. How many are required on an air carrier airplane with 155-passenger seats?

1- 6
2- 3
3- 2
4- 1

267. For how long may a domestic air carrier flight remain on the ground at an inter-
I10 mediate airport before a redispatch release is required?

1- 45 minutes
2- 1 hour
3- 2 hours
4- 6 hours

268. In addition to the basic airplane equipment required for CAT II operations,
D50 what additional equipment is necessary for CAT II decision heights to 100 feet?

1- A third gyroscopic pitch-and-bank indicator system.
2- The marker beacon receiver system must provide both aural and visual indications of the inner marker.
3- Dual localizer and glide slope receiving antennae.
4- The radio altimeter must display the actual height of the flight deck above the terrain.

269. What altitudes or flight levels would be appropriate for a westbound IFR flight
D44 in uncontrolled airspace?

1- 12,500, 16,500, FL 185, and FL 205
2- 12,000, 16,000, FL 180, and FL 200
3- 9,000, 13,000, and 17,000
4- 8,000, 12,000, FL 195, and FL 215

270. What altitudes or flight levels would be appropriate for a westbound IFR
D44 flight in uncontrolled airspace below the PCA?

1- 8,000, 12,000, 14,000, and 16,000
2- 9,000, 11,000, FL 190, and FL 210
3- 12,000, 14,000, FL 180, and FL 200
4- 12,500, 14,500, FL 185, and FL 205

271. An air carrier that elects to use an Inertial Navigation System (INS) must
I91 meet which equipment requirement prior to takeoff on a proposed flight?

1- One INS with a dual VORTAC/ILS system may be used as a backup.
2- Dual ILSs with an operative Flight Director System may be used as a backup for one inoperative INS.
3- One INS may be inoperative, but an operational Doppler Radar unit may be substituted in its stead.
4- Both INSs must be operational.

272. Which is a correct symbol for the stalling speed or the minimum steady flight
A20 speed in a specified configuration?

1- V_S
2- V_A
3- V_{S1}
4- V_{SO}

273. What facilities may be substituted for the middle marker when making a
D42 CAT I ILS approach?

1- DME
2- Compass locator or precision radar
3- Surveillance radar
4- VOR and DME combination fix

274. While in controlled airspace in VFR conditions, what in-flight visibility
D30 is required when flying more than 1,200 feet AGL, and below 10,000 feet MSL?

1- 1 statute mile
2- 2 statute miles
3- 3 statute miles
4- 5 statute miles

275. For IFR operations within the 48 contiguous states and the District of
I23 Columbia, supplemental air carriers are required to list an alternate airport for each destination airport

1- only when the forecast ceiling and visibility are less than 3,000 and 3, from 2 hours before to 2 hours after the ETA.
2- only when the forecast ceiling is less than 1,000 feet above the MEA, MOCA, or initial approach altitude, or forecast visibility is less than 3 miles, from 2 hours before to 2 hours after the ETA.
3- only when the forecast ceiling and visibility are less than 5,000 and 5, from 2 hours before to 2 hours after the ETA.
4- regardless of the reported and forecast weather conditions.

276. What is the minimum number of flight attendants required for an airplane
F11 having a seating capacity of 176 passengers with only 113 passengers aboard?

1- Five
2- Four
3- Three
4- Two

277. An airline transport pilot with an appropriate airplane type rating, who
F36 meets all other training requirements, completed an approved simulator course of training in January of this year. The most recent proficiency flight check was passed in July of last year. For an air carrier flight during March of this year, where three pilots are required, the pilot may

1- serve as third pilot only.
2- not serve in any pilot position.
3- serve in any of the three pilot positions.
4- serve as either second in command or third pilot only.

278. An airplane has a seating capacity for 149 passengers. What is the minimum
F11 number of flight attendants required with 97 passengers aboard?

1- Five
2- Four
3- Three
4- Two

279. Which is <u>one</u> of the requirements that must be met by a required pilot flight
F34 crewmember in reestablishing recency of experience?

1- At least one landing must be made to a full stop with a simulated failure of the most critical engine.
2- At least one landing must be made from an ILS approach to the lowest ILS minimums authorized for the certificate holder.
3- At least two landings must be made to a complete stop.
4- At least two takeoffs must be made with a simulated failure of the most critical powerplant.

280. The flight time limitations established for flight crewmembers for operations
G10 under FAR Part 121, include

1- flight time in scheduled air transportation operations only.
2- all commercial flying in any aircrew position.
3- only commercial flying in an aircrew position in which FAR Part 121 operations are conducted.
4- all flight time in any aircrew position.

281. Which is the correct symbol for the stalling speed or the minimum steady
A20 flight speed in a specified configuration?

1- V_2 min
2- V_{S1}
3- V_S
4- V_{SO}

282. Which use of seat belts is approved in the passenger compartment of a
E33 domestic air carrier airplane during takeoff and landing?

1- Persons who have reached their second birthday, may occupy a divan when individual safety belts are provided.
2- Each person, regardless of age, must occupy a single seat with an approved safety belt.
3- Two persons, one of which is under two years of age, may occupy one seat and share one approved safety belt.
4- Two persons, regardless of age, may occupy a berth and share one approved safety belt.

283. FAR Part 1 defines V_{SO} as the stalling speed or the minimum steady flight speed
A20

1- in the landing configuration.
2- in the takeoff configuration.
3- with the critical engine operative.
4- at which the airplane is controllable.

284. When using a flight recorder which has the erasure feature, which amount of
E40 data may be erased for the purpose of testing the flight recorder system?

1- Any amount of prerecorded data may be erased.
2- Not more than a total of 30 minutes of the oldest data accumulated prior to conducting system testing.
3- Not more than 30 minutes of prerecorded data.
4- A total of 1 hour of the oldest recorded data accumulated at the time of testing.

285. Which is the correct symbol for design cruising speed?
A20

1- V_C
2- V_A
3- M_{MO}
4- V_{MA}

286. When must a cockpit voice recorder be operated?
E44

1- From the start of the before starting engine checklist to completion of checklist prior to engine shutdown.
2- From the start of the before starting engine checklist to completion of final checklist upon termination of flight.
3- When starting to taxi for takeoff to engine shutdown after termination of flight.
4- From start of taxiing for takeoff to completion of landing.

287. What additional certification, if any, is issued to crewmembers of a commercial
I80 operator of U.S. registry to facilitate entry and clearance into ICAO contracting states?

1- A "Crewmember Certificate" issued by the Federal Aviation Administration.
2- None, if flights are made into ICAO member nations.
3- An ICAO International Crewmember Certificate issued by ICAO.
4- Appropriate certification procedures must be followed in each country.

288. What are the certificate and rating requirements for the pilot second in
F33 command on a three-pilot crew of a domestic air carrier?

1- Airline transport pilot; airplane type rating.
2- Commercial pilot; airplane type and instrument rating.
3- Commercial pilot; airplane type rating.
4- Commercial pilot; category, class, and instrument rating.

289. What procedure should you follow if it were necessary to shut down one engine
H24 on a four-engine domestic air carrier airplane while en route?

1- Land at the takeoff alternate listed in the flight dispatch.
2- Proceed to the airport specified by the company dispatcher.
3- Land at any airport you consider as safe as the nearest suitable airport in point of time.
4- Land at the nearest suitable airport in point of time only.

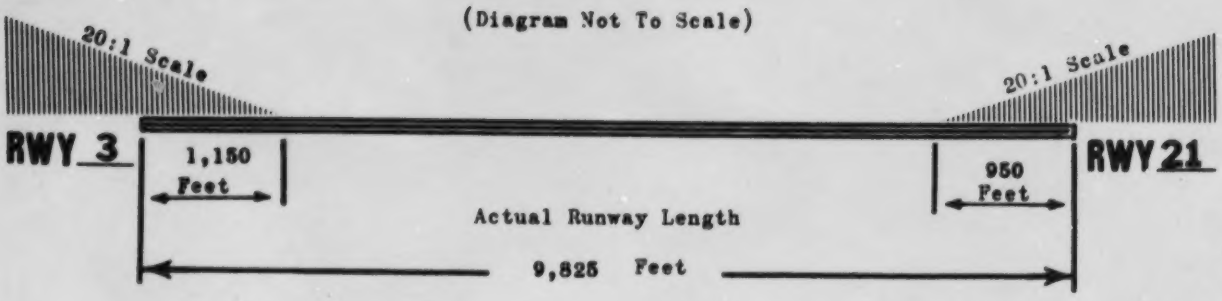


Figure 7

290. What action shall be taken if a flight encounters icing conditions that might
I26 adversely affect the safety of flight? The flight

1- may be continued to the alternate airport, but a landing shall not be made in such icing conditions.
2- shall not be continued, nor shall a landing be made, in such icing conditions.
3- shall not be continued unless approval is received from the company dispatcher and flight operations.
4- may be continued to the original destination airport, provided that all anti-icing and deicing equipment is operational and is used.

291. What maximum computed landing distance may be used by a turbo-propeller powered
E18 airplane to land on Runway 3 (dry) at the alternate airport? (Fig. 7)

1- 6,212 feet
2- 6,072 feet
3- 5,325 feet
4- 5,205 feet

292. What maximum computed landing distance may be used by a turbo-propeller
E18 powered airplane to land on RWY 21 (dry) at the alternate airport? (Fig. 7)

1- 6,212 feet
2- 6,072 feet
3- 5,325 feet
4- 5,205 feet

293. What maximum computed landing distance may be used by a turbine-engine powered
E18 airplane to land on RWY 21 (wet) at the destination airport? (Fig. 7)

1- 6,124 feet
2- 6,783 feet
3- 5,986 feet
4- 6,983 feet

294. What maximum computed landing distance may be used by a turbine-engine powered
E18 airplane to land on RWY 21 (dry) at the destination airport? (Fig. 7)

1- 6,072 feet
2- 5,898 feet
3- 5,205 feet
4- 5,325 feet

295. What maximum computed landing distance may be used by a turbine-engine powered
E18 airplane to land on RWY 3 (wet) at the destination airport? (Fig. 7)

1- 6,124 feet
2- 5,986 feet
3- 6,782 feet
4- 6,982 feet

296. What maximum computed landing distance may be used by a turbine-engine powered
E18 airplane to land on RWY 3 (dry) at the destination airport? (Fig. 7)

1- 5,325 feet
2- 5,205 feet
3- 5,898 feet
4- 6,072 feet

297. If a turbojet air carrier flight is to be operated in VFR over-the-top conditions, which radio navigation equipment is required to be a dual installation?
E42

1- VOR and ILS
2- VOR, DME, and ILS
3- VOR
4- VOR and DME

298. What restrictions must be observed regarding the carrying of cargo forward of the foremost seated passengers?
E19

1- All cargo must be separated from all seated passengers by a partition capable of withstanding certain load stresses.
2- Cargo may be carried in a passenger seat if properly secured by a safety belt.
3- All cargo must be carried in a suitable bin and secured to the floor structure of the airplane.
4- The cargo may be carried in an open bin if it is of a non-toxic or non-flammable nature.

299. What requirement must be met regarding cargo that is carried aft of the foremost seated passengers in an air carrier airplane?
E19

1- The bin in which the cargo is carried must not be installed in a position that restricts access to, or use of, any emergency exit.
2- The cargo may be carried in a passenger seat if properly secured by a safety belt.
3- The container or bin in which the cargo is carried must be made of material which is at least flash resistant.
4- The cargo may be carried in an open bin if the bin is of a non-toxic or non-flammable nature.

300. What procedure should you follow if it were necessary to shut down one engine on a two-engine domestic air carrier airplane while en route?
H24

1- Land at any airport you consider as safe as the nearest suitable airport in point of time.
2- Proceed to the airport specified by the company dispatcher.
3- Land at the takeoff alternate listed in the flight dispatch.
4- Land at the nearest suitable airport in point of time at which a safe landing can be made.

301. Unless otherwise authorized by ATC, what is the maximum indicated airspeed at which a Boeing 727 can operate within an Airport Traffic Area?
D20

1- 275 knots
2- 250 knots
3- 230 knots
4- 200 knots

302. Your flight logbook for the month of May shows these entries:
G10

May 6 - air carrier flight - 4.0
May 7 - air carrier flight - 7.0
May 9 - charter flight - 6.0
May 10 - commercial flight instruction - 4.0
May 11 - pleasure flight - 4.0
May 12 - charter flight - 5.0

How many additional hours, if any, can you fly for this domestic air carrier on May 14 without exceeding the maximum authorized in any 7 consecutive days?

1- Fifteen additional hours
2- Four additional hours
3- Two additional hours
4- None

303. What minimum weather conditions must exist for a domestic air carrier flight to takeoff from a refueling airport (within the United States) which is not listed in the air carrier's operations specifications? (Takeoff minimums are not prescribed for that airport.)
I34

1- 800-2, 1,000-1 1/2, or 1,500-1
2- 800-2, 900-1 1/2, or 1,000-1
3- 600-3, 1,000-2, or 1,200-1
4- 600-2, 1,000-1 1/2, or 1,000-2

304. For which operations within the contiguous United States and the District of Columbia must an alternate airport be listed regardless of existing or forecast weather conditions?
I23

1- Supplemental and flag
2- Commercial and supplemental
3- Domestic
4- Domestic and flag

305. What action should be taken by the pilot in command of a transport category airplane if the airborne weather radar becomes inoperative en route on an IFR flight for which weather reports indicate possible thunderstorms?
E43

1- Request ATC for radar vectors to the nearest airport suitable for large aircraft landings.
2- In such an event, proceed in accordance with the approved instructions in the operations manual.
3- Return to the departure airport if closer than the destination airport.
4- Fly to and land at the nearest approved air carrier airport.

306. An airline transport pilot with an appropriate airplane type rating, who meets all other training requirements, completed an approved simulator course of training in October of this year. The most recent proficiency flight check was passed in March of last year. For an air carrier flight during March of this year, where three pilots are required, the pilot may
F36

1- serve as third pilot only.
2- serve as either second in command or third pilot only.
3- serve in any of the three pilot positions.
4- not serve in any pilot position.

307. In lieu of reported ground visibility, what minimum in-flight visibility is required under the provisions of Special VFR, for takeoff from an airport located within a control zone?
D31

1- 1 statute mile
2- 2 statute miles
3- 3 statute miles
4- 5 statute miles

308. When the ground visibility is not reported for an airport within a control zone, what is the minimum in-flight visibility required for takeoff under the provisions of Special VFR?
D31

1- 5 statute miles
2- 3 statute miles
3- 2 statute miles
4- 1 statute mile

309. A three-engine turbojet transport airplane operated IFR along victor or jet airways by a domestic air carrier must be equipped with an approved DME receiver
E42

1- only during operations at or above FL 240.
2- only during operations at or above FL 180.
3- regardless of operating altitude.
4- during operations in positive control airspace only.

310. What procedure is required regarding the handling of a dangerous or deadly unloaded weapon that is declared in the personal baggage of a passenger?
H32

1- The baggage must be locked and the key retained by a person other than the owner of the weapon.
2- The baggage must remain locked and carried in an area other than the flight crew compartment that is inaccessible to other passengers.
3- The baggage may be carried in the flight crew compartment if a flight crewmember retains the key.
4- The baggage must be placed beneath the passenger's seat and the key retained by the passenger.

311. Prior to checking personal baggage, a passenger notifies the certificate holder that an unloaded weapon is inside. What procedure is required regarding the handling of this baggage?
H32

1- The baggage must remain locked and carried in an area other than the flight crew compartment that is inaccessible to passengers.
2- The baggage must remain locked and custody of the key to the baggage must remain with a designated person other than the owner of the weapon.
3- When baggage size permits, it must be placed beneath the passenger's seat or within the passenger compartment, and the passenger must retain the key.
4- The baggage may be carried in the flight crew compartment, provided it is locked and a flight crewmember retains the key.

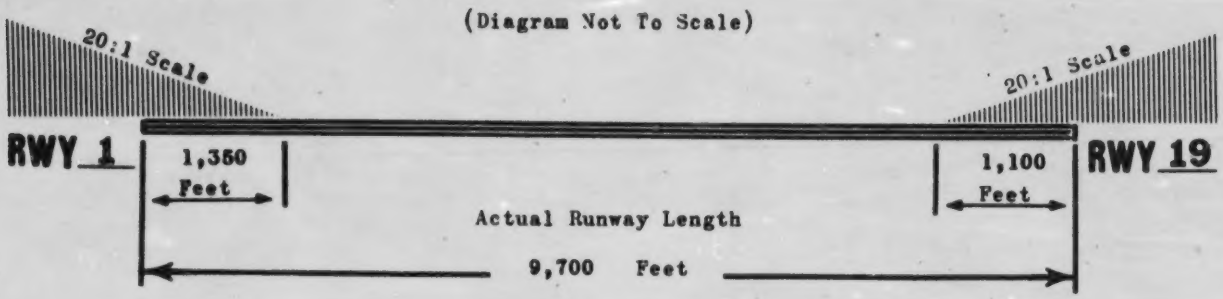


Figure 8

312. What maximum computed landing distance may be used by a turbo-propeller powered
E18 airplane to land on Runway 19 (dry) at the destination airport? (Fig. 8)

1- 5,820 feet
2- 5,845 feet
3- 6,020 feet
4- 6,790 feet

313. What maximum computed landing distance may be used by a turbine-engine powered
E18 airplane to land on Runway 1 (dry) at the destination airport? (Fig. 8)

1- 6,630 feet
2- 6,480 feet
3- 5,160 feet
4- 5,010 feet

314. What maximum computed landing distance may be used by a turbine-engine powered
E18 airplane to land on Runway 19 (dry) at the destination airport? (Fig. 8)

1- 5,010 feet
2- 5,160 feet
3- 5,820 feet
4- 6,020 feet

315. What maximum computed landing distance may be used by a turbine-engine powered
E18 airplane to land on Runway 1 (wet) at the destination airport? (Fig. 8)

1- 7,452 feet
2- 6,693 feet
3- 5,934 feet
4- 5,761 feet

316. What maximum computed landing distance may be used by a turbo-propeller powered
E18 airplane to land on Runway 1 (dry) at the destination airport? (Fig. 8)

1- 6,790 feet
2- 6,020 feet
3- 5,845 feet
4- 5,820 feet

317. What maximum computed landing distance may be used by a turbo-propeller powered
E18 airplane to land on Runway 1 (dry) at the alternate airport? (Fig. 8)

1- 5,820 feet
2- 5,845 feet
3- 6,020 feet
4- 6,790 feet

318. What maximum computed landing distance may be used by a turbo-propeller powered
E18 airplane to land on Runway 19 (dry) at the alternate airport? (Fig. 8)

1- 6,790 feet
2- 6,020 feet
3- 5,845 feet
4- 5,820 feet

319. When a flight engineer is a required crewmember on a flight, it is necessary for
F10

1- both pilots to hold Flight Engineer Certificates.
2- at least one pilot to hold a Flight Engineer Certificate.
3- the flight engineer to be properly certificated and qualified, but there is no requirement for any other crewmember to be qualified or certificated to perform flight engineer duties.
4- at least one pilot to be qualified to perform flight engineer duties, but a certificate is not required.

320. An air carrier airplane which has a seating capacity of 187 has 151 passengers on board. What is the minimum number of flight attendants required?
F11

1- Five
2- Four
3- Three
4- Two

321. What action shall be taken if a flight encounters icing conditions that might adversely affect the safety of flight? The flight
I26

1- may be continued to the original destination airport, provided that all anti-icing and deicing equipment is operational and is used.
2- shall not be continued unless approval is received from the company dispatcher and flight operations.
3- shall not be continued, nor shall a landing be made, in such icing conditions.
4- may be continued to the alternate airport, but a landing shall not be made in such icing conditions.

322. When entering an Airport Traffic Area for a landing, what altitude above the surface shall each pilot maintain when operating a large airplane?
D24

1- 2,000 feet
2- 1,500 feet
3- 1,000 feet
4- 800 feet

323. What is the minimum recent instrument approach experience required, prior to the date of the practical test, to renew CAT II pilot authorization?
B20

1- Within the previous 12 months, nine ILS approaches flown manually to CAT I DHs.
2- Within the previous 6 months, six ILS approaches, three of which may be flown to CAT I DHs by use of an approach coupler.
3- Within the previous 12 calendar months, six ILS approaches flown by use of an approach coupler to CAT II DHs.
4- Within the previous 6 months, three ILS approaches flown by use of an approach coupler to CAT II DHs.

324. Which document contains the approved procedures for dispatch, or continuing flight, when a required item of aircraft equipment becomes inoperative?
I25

1- Operations specifications
2- Amended dispatch/flight release
3- Original dispatch release
4- Minimum Equipment List

325. Which is a correct airplane speed symbol and definition?
A20

1- V_{LE} - maximum speed for extending landing gear.
2- V_{S1} - stalling or minimum steady flight speed obtained in a specified configuration.
3- V_F - maximum speed for flap extension.
4- V_{MA} - design maximum maneuvering speed.

326. An airline transport pilot may log as pilot in command time
B13

1- all the flight time during which the pilot is required to be on the flight deck as a crewmember.
2- all the flight time the pilot acts as pilot in command or second in command in FAR Part 121 operations.
3- all the flight time during which the pilot acts as pilot in command.
4- only the flight time during which the pilot is the sole manipulator of the controls.

327. A certificate holder is notified that a person, specifically authorized to
H32 carry a deadly weapon, is to be aboard an aircraft. Except in an emergency, how long before loading that flight should the air carrier be notified?

1- 5 hours
2- 2 hours
3- 1 hour
4- 30 minutes

328. A passenger briefing by a crewmember shall be given instructing passengers
E37 on the necessity and use of oxygen in the event of cabin depressurization prior to flights conducted above

1- FL 250.
2- FL 240.
3- FL 200.
4- FL 180.

329. The reserve fuel supply required for a domestic air carrier flight in a
I40 turbojet powered airplane is

1- 30 minutes at holding fuel consumption; 1,500 feet above the destination or alternate airport.
2- 45 minutes at normal fuel consumption.
3- 30 minutes at normal fuel consumption.
4- 45 minutes at holding fuel consumption; 1,500 feet above the destination or alternate airport.

330. What is the required reserve fuel supply for a domestic air carrier
I40 flight in a turbojet powered airplane?

1- 45 minutes at normal fuel consumption.
2- 30 minutes at normal fuel consumption computed at 2,000 feet above the destination or alternate airport.
3- 45 minutes at holding airspeed fuel consumption.
4- 30 minutes at normal fuel consumption.

331. In all controlled airspace of the 48 contiguous states and the District of
D16 Columbia, in what altitude structure is an operative, appropriately equipped ATC transponder required?

1- Above 14,500 feet MSL, excluding the airspace at and below 1,500 feet AGL.
2- Above 2,500 feet AGL, excluding the airspace at and below 1,200 feet AGL.
3- Above FL 180, excluding the airspace at and below 2,500 feet AGL.
4- Above 12,500 feet MSL, excluding the airspace at and below 2,500 feet AGL.

332. How is the reserve fuel supply computed for a three-engine turbojet powered
I40 domestic air carrier airplane?

1- 45 minutes at holding fuel consumption; 1,500 feet above the destination or alternate airport.
2- 30 minutes at normal fuel consumption.
3- 45 minutes at normal fuel consumption.
4- 30 minutes at holding fuel consumption; 1,000 feet above the destination or alternate airport.

333. What minimum weather conditions must exist for a domestic air carrier flight
I34 to takeoff from a refueling airport (within the United States) which is <u>not</u> listed in the air carrier's operations specifications? (No prescribed takeoff minimums are listed for that airport.)

1- 900-2, 800-3, or 600-2 1/2.
2- 1,000-1, 900-1 1/2, or 800-2.
3- 1,000-1, 900-2, or 800-3.
4- 900-1, 800-2, or 600-2 1/2.

334. V_S is the stalling speed or minimum steady flight speed
A20

1- at which the airplane is controllable.
2- obtained in a specified configuration.
3- with the critical engine inoperative.
4- in the landing configuration.

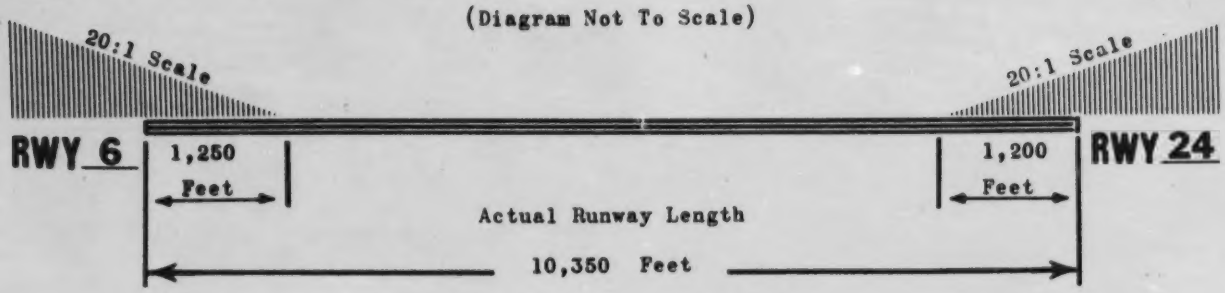


Figure 9

335. If your flight is advised that pilot reports indicate icing conditions
I26 which might adversely affect the safety of flight, the operation

1- shall not be continued except by joint approval of the dispatcher and ATC.
2- shall not be continued or a landing made in such icing conditions.
3- may be continued only if all anti-icing and deicing equipment is operating normally.
4- may be continued, but a landing shall not be made in such icing conditions.

336. What maximum computed landing distance may be used by a turbo-
E18 propeller powered airplane to land on RWY 24 (dry) at the destination airport? (Fig. 9)

1- 7,141 feet
2- 6,405 feet
3- 6,370 feet
4- 6,230 feet

337. What maximum computed landing distance may be used by a turbo-
E18 propeller powered airplane to land on RWY 6 (dry) at the destination airport? (Fig. 9)

1- 7,141 feet
2- 6,405 feet
3- 6,370 feet
4- 6,230 feet

338. What maximum computed landing distance may be used by a turbine-engine powered
E18 airplane to land on RWY 24 (wet) at the destination airport? (Fig. 9)

1- 5,451 feet
2- 6,279 feet
3- 6,313 feet
4- 7,141 feet

339. What maximum computed landing distance may be used by a turbine-engine powered
E18 airplane to land on RWY 6 (wet) at the destination airport? (Fig. 9)

1- 7,141 feet
2- 6,313 feet
3- 6,279 feet
4- 5,451 feet

340. What maximum computed landing distance may be used by a turbine-engine powered
E18 airplane to land on RWY 24 (dry) at the alternate airport? (Fig. 9)

1- 6,370 feet
2- 6,210 feet
3- 5,490 feet
4- 5,460 feet

341. What maximum computed landing distance may be used by a turbine-engine powered
E18 airplane to land on RWY 6 (dry) at the destination airport? (Fig. 9)

1- 6,370 feet
2- 6,210 feet
3- 5,490 feet
4- 5,460 feet

342. Advection fog has drifted over a coastal airport during the day.
L40 What may tend to dissipate or lift this fog into low stratus clouds?

1- Nighttime cooling.
2- Sea breeze effect of approximately 15 knots or stronger.
3- Heating from adjacent industrial areas.
4- Dryness of the land surface.

343. What conditions are necessary for the formation of thunderstorms?
L30

1- Lifting force, high humidity, and unstable conditions.
2- High humidity, high temperature, and cumulus clouds.
3- Low pressure, high humidity, and cumulus clouds.
4- Lifting force, high temperature, and unstable conditions.

344. What are the characteristics of unstable air?
K21

1- Turbulence and poor visibility.
2- Turbulence and good visibility.
3- Nimbostratus clouds and poor visibility.
4- Nimbostratus clouds and good visibility.

345. The station originating the following weather report has a field elevation
L45 of 1,800 feet MSL. If the sky cover is one continuous layer, what is its thickness?

W8X1FK 174/74/73/ØØØØ/ØØ4/ OVC 35

1- 2,700 feet
2- 2,500 feet
3- 1,700 feet
4- 800 feet

346. Which situation is most conducive to the formation of advection fog?
L40

1- A light breeze blowing colder air out to sea.
2- A warm, moist air mass on the windward side of the mountains.
3- An air mass moving inland from the coast in wintertime.
4- Warm, moist air settling over a cool surface under no-wind conditions.

347. Clouds, fog, or dew will always form when
K11

1- the temperature and dewpoint are equal.
2- water vapor condenses.
3- the dewpoint is higher than the temperature.
4- relative humidity exceeds 100%.

348. While maintaining FL 310, you observe the OAT is 15° colder than standard.
J31 What is the relationship between true altitude and pressure altitude?

1- True altitude would be lower than 31,000 feet.
2- Pressure altitude is lower than true altitude.
3- It would be impossible to determine the relationship.
4- They are both the same, 31,000 feet.

349. Frontal waves normally form on

K41

1- stationary or occluded fronts.
2- rapidly moving cold fronts or warm fronts.
3- slow moving warm fronts or occluded fronts.
4- slow moving cold fronts or stationary fronts.

350. Frontal activity can produce fogs which are a result of
L40

1- nocturnal cooling.
2- evaporation of surface moisture.
3- saturation due to evaporation of precipitation.
4- adiabatic cooling.

351. Which of the following features do you normally associate with the "cumulus
L31 stage" of thunderstorm formation?

1- Heavy rain at surface
2- Continuous updraft
3- Frequent lightning
4- Roll cloud

352. On a cold, clear night ice can form on a surface directly from water vapor.
K11 This process is known as

1- sublimation.
2- evaporation.
3- supercooling.
4- supersaturation.

353. Clouds are divided into four families according to their
K30

1- outward shape.
2- height range.
3- composition.
4- origin.

354. What is the process by which ice can form on a surface directly from water
K11 vapor on a cold, clear night?

1- Sublimation
2- Evaporation
3- Supersaturation
4- Condensation

355. Which atmospheric process tends to increase the stability of an air mass?
K21

1- Sublimation from ice or snow to the lower layers of an air mass.
2- Orographic lifting of an air mass.
3- Subsidence of a relatively thick layer of air.
4- Advection of a cold air mass over a warmer surface.

356. A situation most conducive to the formation of advection fog is
L40

1- an air mass moving inland from the coastline during the winter.
2- a warm, moist air mass settling over a cool surface in no-wind conditions.
3- a warm, moist air mass on the windward side of a mountain.
4- a light breeze moving colder air over a water surface.

357. You are maintaining a constant pressure altitude and the outside air tem-
J31 perature is warmer than standard for that altitude. What is the density altitude with respect to pressure altitude?

1- Lower
2- Higher
3- Impossible to determine
4- Same

358. Steady precipitation, in contrast to showery, preceding a front is an indi-
K41 cation of

1- cumuliform clouds with moderate turbulence.
2- stratiform clouds with moderate turbulence.
3- cumuliform clouds with little or no turbulence.
4- stratiform clouds with

359. Which weather phenomenon is always associated with the passage of a
K41 frontal system?

1- Clouds, either ahead or behind the front.
2- Inherent instability of the air being replaced.
3- An abrupt and sizable temperature change.
4- A change in wind direction.

360. Moisture and vertical movement have what effect on the stability of an air mass?
K21

1- Sinking of an air mass and addition of water vapor to the lower layers tend to decrease its stability.
2- Lifting of an air mass and removal of water vapor from the lower layers tend to decrease its stability.
3- Sinking of an air mass and removal of water vapor from the lower layers tend to increase its stability.
4- Lifting of an air mass and addition of water vapor to the lower layers tend to increase its stability.

361. Hazardous wind shear is commonly encountered near the ground
J47

1- during periods when the wind velocity is stronger than 35 knots and near mountain valleys.
2- during periods of strong temperature inversion and near thunderstorms.
3- near mountain valleys and on the windward side of a hill or mountain.
4- near thunderstorms and during periods when the wind velocity is stronger than 35 knots.

362. What is the recommended action a pilot should take with respect to temperature
M13 indications to cross a jet stream core to minimize the effects of CAT?

1- If temperature rises--climb; if temperature decreases--descend.
2- Climb to a higher altitude when the temperature rises or decreases.
3- If temperature rises--descend; if temperature decreases--climb.
4- Descend to a lower altitude when the temperature rises or decreases.

363. When the sky condition or ceiling is omitted on an ATIS broadcast,
R42 both conditions must be above

1- 5,000 feet AGL.
2- 3,000 feet AGL.
3- 2,000 feet AGL.
4- 1,500 feet AGL.

364. What determines the type of structural icing that can form on the
L20 surface of an aircraft?

1- Rate at which water freezes upon contact with aircraft.
2- Temperature of the air and the aircraft surface.
3- Size of the water droplets and outside air temperature.
4- Percent of relative humidity and outside air temperature.

365. The conditions necessary for thunderstorm formation are
L30

1- lifting force, unstable conditions, and cumulus clouds.
2- low pressure, high humidity, and cumulus clouds.
3- high humidity, unstable conditions, and lifting force.
4- high humidity and temperature, and cumulus clouds.

366. An airport has a field elevation of 1,800 feet at the station originating
L45 the following weather report.

W8X1FK 174/74/73/0000/004 OVC 40

What is the thickness of the sky cover if it is one continuous layer?

1- 2,200 feet
2- 3,000 feet
3- 3,200 feet
4- 4,000 feet

367. Which feature is associated with the tropopause?
M10

1- Absolute upper limit of cloud formation.
2- Abrupt change in temperature lapse rate.
3- Constant height above the earth.
4- Absence of wind and turbulent conditions.

368. What determines the amount of water vapor a parcel of air can hold?
K10

1- Temperature of the air.
2- Stability of the air mass.
3- Temperature/dewpoint spread.
4- Relative humidity.

369. To what does the term "dewpoint" refer?

K10 1- The spread between actual temperature and temperature during evaporation.
2- The temperature at which the evaporation and condensation points are equal.
3- The temperature to which air must be cooled to become saturated.
4- The temperature at which fog will form.

370. A temperature inversion is a condition which exists only in
K21

1- stable air.
2- winter.
3- summer.
4- unstable air.

371. Which weather phenomenon signals the beginning of the mature stage of a
L31 thunderstorm?

1- The appearance of an anvil top.
2- The start of rain at the surface.
3- A sharp drop in temperature.
4- Strong and gusty surface winds.

372. Thunderstorms which generally produce severe conditions, such as destructive
L33 winds and heavy hail, are

1- cold front thunderstorms.
2- warm front thunderstorms.
3- squall line thunderstorms.
4- air mass thunderstorms.

373. What are the processes by which moisture is added to unsaturated air?
K11

1- Heating and sublimation.
2- Evaporation and sublimation.
3- Heating and condensation.
4- Supersaturation and evaporation.

374. The localities in which radiation fog would most likely occur are
L40

1- level inland areas.
2- mountain slopes.
3- coastal areas.
4- mountain valleys.

375. With respect to temperature indications, what is the recommended pilot action
M13 that will minimize the effect of CAT when crossing the core of a jet stream?

1- When temperature increases or decreases, climb.
2- When temperature increases, climb; when temperature decreases, descend.
3- When temperature increases, descend; when temperature decreases, climb.
4- When temperature increases or decreases, descend.

376. En route to FL 250, the altimeter is set correctly. On descent, a pilot
J31 fails to reset it to a local altimeter setting of 30.57. If the field elevation is 650 feet, and the altimeter is functioning properly, what will it indicate after landing?

1- Sea level
2- 585 feet
3- 715 feet
4- 1,300 feet

377. Which thunderstorms generally produce the most severe conditions, such as
L33 heavy hail and destructive winds?

1- Air mass thunderstorms.
2- Warm front thunderstorms.
3- Squall line thunderstorms.
4- Cold front thunderstorms.

378. The amount of water vapor a parcel of air can hold is determined by
K10

1- relative humidity.
2- the temperature of the air.
3- the dewpoint/temperature spread.
4- the stability of the air mass.

379. Why does the wind have a tendency to follow the isobars above the friction
J30 level?

1- The Coriolis force tends to counterbalance the horizontal pressure gradient.
2- The Coriolis force acts perpendicular to a line connecting the highs and lows.
3- The friction of the air with the earth deflects the air perpendicular to the pressure gradient.
4- Isobars are lines connecting points of equal wind direction aloft.

380. How is the stability of an air mass affected by vertical movement and
K21 moisture?

1- Lifting of an air mass and adding moisture to lower layers tend to increase stability.
2- Lifting of an air mass and removal of moisture from lower layers tend to decrease air mass stability.
3- Sinking of an air mass and removal of water vapor from lower layers tends to increase its stability.
4- Sinking of an air mass and addition of water vapor to lower layers tend to decrease air mass stability.

381. Which weather phenomenon is always associated with the passage of a frontal
K41 system?

1- Clouds, either ahead or behind the frontal system.
2- Inherent instability of the air being replaced.
3- An abrupt and sizable temperature change.
4- A change in wind direction.

382. What determines the structure or type of clouds which will form as a result of
K21 air being forced to ascend?

1- The relative humidity of the air after lifting occurs.
2- The stability of the air before lifting occurs.
3- The amount of condensation nuclei present after lifting occurs.
4- The method by which the air is lifted.

383. In general terms, what is the migration pattern, level, and strength of the jet
J45 stream during the winter months in the middle and high latitudes?

1- Shift toward the south, core rises to a higher altitude, and speed increases.
2- Shift toward the north, core rises to a higher altitude, and speed decreases.
3- Shift toward the south, core descends to a lower altitude, and speed increases.
4- Shift toward the north, core descends to a lower altitude, and speed decreases.

384. What effect may tend to lift advection fog into low stratus clouds?
L40

1- Surface winds of approximately 15 knots or stronger.
2- Dryness of the underlying land mass.
3- Nighttime cooling.
4- Heating from adjacent industrial areas.

385. If the outside air temperature at a given altitude is warmer than stand-
J31 ard, the density altitude is

1- lower than true altitude.
2- higher than pressure altitude.
3- higher than true altitude but lower than pressure altitude.
4- lower than pressure altitude, but approximately equal to the true altitude.

386. The term "dewpoint" refers to the

K10 1- spread between actual temperature and temperature during evaporation.
2- temperature at which the evaporation and condensation points are equal.
3- temperature to which air must be cooled to become saturated.
4- temperature at which fog will form.

387. From which measurement of the atmosphere can stability be determined?
J22

1- Surface temperature
2- Actual lapse rate
3- Atmospheric pressure
4- Wind

388. Every physical process of weather is accompanied by, or is the result of,
J21

1- a heat exchange.
2- moisture.
3- the movement of air.
4- a pressure differential.

389. Assume a field elevation of 1,800 feet at the station originating the
L45 following weather report. If the sky cover is one continuous layer, what is its thickness?

W8X1FK 174/74/73/0000/004/ OVC 50

1- 4,000 feet
2- 3,200 feet
3- 3,000 feet
4- 2,200 feet

390. What is an important characteristic of wind shear?
J47

1- It usually exists only in the vicinity of thunderstorms but may be found near a strong temperature inversion.
2- It can be present at any level and can exist in both a horizontal and vertical direction.
3- It occurs primarily at the lower levels and is usually associated with mountain waves.
4- It exists in a horizontal direction only, and is normally found near a jet stream.

391. What causes variations in altimeter settings between weather reporting
J31 points?

1- Unequal heating of the earth's surface.
2- Variation of terrain elevation creating barriers to the movement of an air mass.
3- Coriolis force reacting with friction.
4- Friction of the air with the earth's surface.

392. Where will the area of strongest turbulence be encountered when departing a
J45 jet stream?

1- Above the core on the polar side.
2- Above the core on the equatorial side.
3- Below the core on the polar side.
4- Below the core on the equatorial side.

393. An important characteristic of wind shear is that it
J47

1- exists only in the vicinity of thunderstorms and can be found where a temperature inversion exists.
2- occurs primarily at lower levels and is usually associated with mountain waves.
3- exists only in a horizontal direction and is found near a jet stream.
4- can be present at any level and can exist in a horizontal and vertical plane.

394. Fogs produced by frontal activity are generally a result of saturation due to
L40

1- evaporation of surface moisture.
2- nocturnal cooling.
3- evaporation of precipitation.
4- adiabatic cooling.

395. Which feature is normally associated with the "cumulus stage" of a thunderstorm?
L31

1- Roll cloud.
2- Continuous updraft.
3- Frequent lightning.
4- Beginning of rain at the surface.

396. Stability of the atmosphere can be determined by the measurement of the
J22

1- actual temperature lapse rate.
2- atmospheric pressure at various levels.
3- wind velocity and atmospheric pressures.
4- surface temperature.

397. Moisture is added to a parcel of air by two processes. These are
K11

1- sublimation and heating.
2- supersaturation and evaporation.
3- heating and condensation.
4- evaporation and sublimation.

398. Variations in altimeter settings between weather reporting stations are caused by
J31

1- restrictions to air mass movement caused by natural terrain barriers.
2- friction of the air with the earth's surface.
3- unequal heating of the surface of the earth.
4- Coriolis force reacting with friction.

399. In what localities is radiation fog most likely to occur?
L40

1- Mountain slopes.
2- Level inland areas.
3- Coastland areas.
4- Mountain valleys.

400. The mature stage of a thunderstorm is normally signaled by
L31

1- strong, gusty surface winds.
2- a sharp drop in temperature.
3- the appearance of the anvil top.
4- the start of rain at the surface.

401. In which direction should a pilot correct the aircraft heading to maintain a
K41 desired course when flying through a frontal system on a flight from St. Louis to New York?

1- To the left when flying from a cold to a warm front.
2- To the right when flying from a warm to a cold front; to the left when flying from a cold to a warm front.
3- To the left when flying from a warm to a cold front.
4- To the right regardless of the type of frontal system.

402. The station originating the following weather report has a field elevation of
L45 3,500 feet MSL. If the sky cover is one continuous layer, what is its thickness?

W5X1/2 HK 173/72/73/0000/002/OVC 75

1- 2,500 feet
2- 3,000 feet
3- 4,000 feet
4- 7,000 feet

403. Which conditions are most conducive to the formation of radiation fog?
L40

1- A warm, moist air mass on the windward side of mountains.
2- Warm, moist air over flatland areas on clear nights with calm winds.
3- Moist, tropical air moving over cold offshore water.
4- The movement of cold air over much warmer water.

404. What is the implied minimum surface visibility when the sky condition and
R42 visibility are omitted from an ATIS broadcast?

1- 2 miles
2- 3 miles
3- 5 miles
4- 6 miles

405. Freezing rain encountered during climb is normally evidence that
K11

1- there exists a layer of warmer air above.
2- you can climb to a higher altitude without encountering more than light icing.
3- a cold front has passed.
4- there are thunderstorms in the area.

406. A station is forecasting wind and temperature aloft at FL 390 to be
N34 300° at 200 knots; temperature -54°C. How would this data be encoded in the FD?

1- 3Ø9954
2- 8Ø9954
3- 3ØØ54
4- 8Ø99-54

407. Refer to the following excerpt from an hourly SA report:
N31

SA271ØØ
LAX...172/86/72/3Ø1Ø/994....

Using the necessary information, at what altitude AGL should you expect the bases of convective-type cumuliform clouds?

1- 5,000 feet
2- 3,500 feet
3- 2,500 feet
4- 1,500 feet

408. A station is forecasting wind and temperature aloft at FL 390 to be
N34 290° at 195 knots; temperature -49°C. How would this data be encoded in the FD?

1- 7995-49
2- 79ØØ49
3- 799549
4- 299554

409. What is the significance of the "RB32" entered in the Remarks of
N17 this SA?

SA22 191ØØ6
FSM 25 SCT M44 OVC 7RW-Ø93/71/68/ ØØØØ/983/RB32

1- Runway braking factor is 32.
2- Rain began at 1032Z at FSM.
3- The runway barrier (arresting gear) for Runway 32 is inoperative.
4- The maximum weight limitation (runway bearing) is 32,000 pounds.

410. The maximum valid time period for a Convective Outlook (AC) is
N37

1- 8 hours.
2- 12 hours.
3- 18 hours.
4- 24 hours.

411. A Terminal Forecast (FT) is issued at specific times in the U.S. for a
N30 geographical area within

1- a 5-mile radius of the center of a runway complex.
2- a 10-mile radius of the reporting station.
3- a 15-mile radius of a control tower.
4- 25 miles of the center of an airport.

412. What term is used to classify a sudden increase in windspeed of at least 15
N15 knots to a sustained speed of 20 knots or more for at least 1 minute's duration?

1- COL wind
2- Gust
3- Squall
4- Katabatic wind

413. The single source reference providing the pilot with information regarding
N31 turbulence, icing conditions, and frontal movement is the

1- Terminal Forecast (FT).
2- 750 MB Prognostic Chart.
3- Weather Depiction Chart.
4- Area Forecast (FA).

414. The temperature of the air at the surface is 98°F. and the dewpoint is
K21 88°F. At approximately what altitude above the surface should you expect the base of cumuliform clouds?

1- 6,000 feet
2- 5,000 feet
3- 2,500 feet
4- 1,500 feet

415. The station originating the following weather report has a field elevation of
L45 2,100 feet MSL. If the sky condition is one continuous layer, what is its thickness?

W3X 1/4FH 172/71/72/ØØØØ/ØØ3/OVC 28

1- 300 feet
2- 700 feet
3- 2,400 feet
4- 2,500 feet

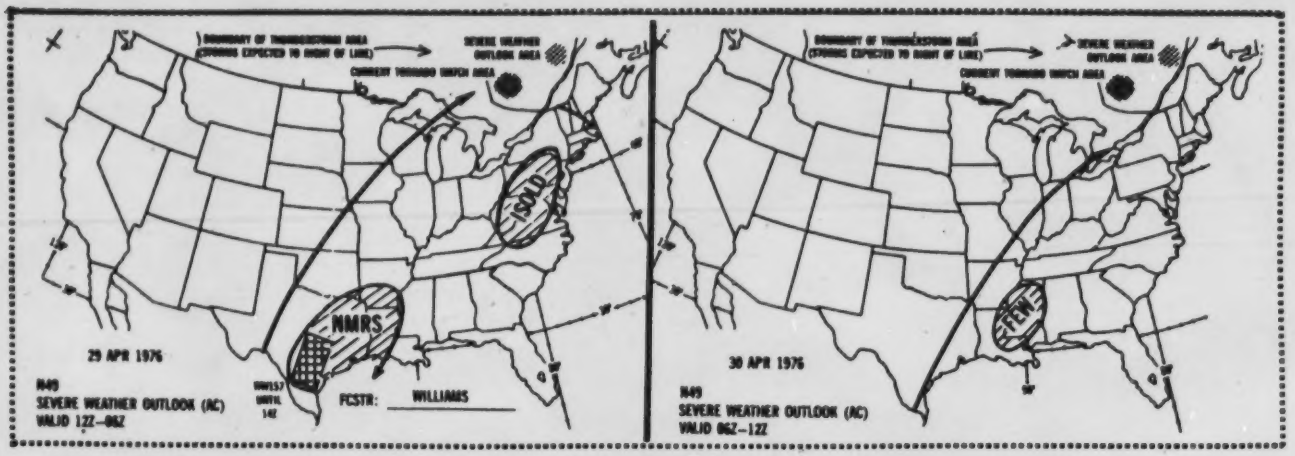


Figure 10

416. The Severe Weather Outlook Chart (Fig. 10), in addition to the weather areas depicted, may include
070

1- areas of severe icing.
2- hurricanes and tropical storms.
3- a squall line symbol and expected time of development.
4- a low level wind shear line.

417. The Severe Weather Outlook Chart (Fig. 10), which is used primarily for advance planning, provides
070 what information?

1- Preliminary 24-hour severe weather outlook for general and severe thunderstorm activity, tornadoes, watch areas, may include a squall line symbol.
2- It depicts areas of moderate to severe thunderstorm activity only.
3- It depicts areas of expected hurricane or tornado activity only.
4- Preliminary 12-hour outlook for severe thunderstorm activity and probable convective turbulence.

66

418. The Severe Weather Outlook Chart (Fig. 10) is a preliminary 24-hour outlook presented in two panels. In addition to
070 the information portrayed, the chart may also depict

1- hurricane watch areas.
2- areas of severe icing.
3- severe low-level wind shear areas.
4- a squall line symbol and expected time of development.

419. In addition to the weather information depicted, the Severe Weather Outlook Chart (Fig. 10) may also portray
070

1- low-level wind shear lines.
2- squall line symbols.
3- areas of severe icing.
4- areas of severe convective turbulence.

67

420. What wind conditions would you anticipate when squalls are reported at your
N15 destination?

1- Peak gusts of at least 35 knots combined with a change in wind direction of 30° or more.
2- Sudden increases in windspeed of at least 25 knots to a sustained speed of 30 knots or more.
3- Rapid variations in windspeed of 15 knots or more between peaks and lulls.
4- Variations of at least 90° in wind direction when windspeeds are above 20 knots.

421. What is the significance of the "RB35" entered in the Remarks of the SA191400
N17 for MLC?

SA21 191400
MLC SP S SCT E18 OVC 7R-123/64/62/
3307/992/RB35

1- Runway arresting gear is inoperative on RWY 35.
2- Rain began at 1335Z at MLC.
3- Cloud tops of rain showers at 3,500 feet AGL determined by radiosonde balloon soundings.
4- Runway braking factor is 35% of dry runway surface due to light rain.

422. The National Weather Service prepares Area Forecasts (FA) every
N31

1- 6 hours.
2- 8 hours.
3- 12 hours.
4- 18 hours.

423. What significant cloud coverage is reported by a pilot in this SA?
N20

SA22 181407
MOB M9 OVC 2LF 131/44/43/3212/991/
UA/OV 15NW MOB 1355/SK OVC
025/075 OVC 135

1- The top of lower overcast is 2,500 feet; base and top of second overcast layer is 7,500 and 13,500 feet respectively.
2- The base of second overcast layer is 2,500 feet; top of second overcast layer is 7,500 feet; base of third layer is 13,500 feet.
3- Three separate overcast layers exist with tops at 2,500, 7,500, and 13,500 feet.
4- Three separate overcast layers exist with bases at 2,500, 7,500, and 13,500 feet.

424. What information is provided by a CONVECTIVE OUTLOOK?
N37

1- Prospects of general and severe thunderstorm activity during the next 24 hours.
2- Forecast of low level cloudiness and fog conditions during the next 18- to 24-hour period.
3- Outlines areas of unstable air masses at the upper levels of wind shear expected to exist during the next 6 hours.
4- Areas of wind shear expected at the lower levels during the next 18- to 24-hour period.

425. What is the valid time period for an Area Forecast (FA)?
N31

1- 12 hours, plus an 8-hour outlook.
2- 18 hours, plus a 12-hour outlook.
3- 8 hours, plus a 12-hour outlook.
4- 8 hours, plus an 8-hour outlook.

426. Refer to the following excerpt from an hourly SA report:
N31

SA190900
TUC...183/93/45/2115/993....

Using the necessary information, at what altitude AGL should you expect the bases of convective-type cumuliform clouds?

1- 12,000 feet
2- 10,000 feet
3- 8,500 feet
4- 4,000 feet

427. The information in a CONVECTIVE OUTLOOK provides
N37

1- a forecast of clear air turbulence (CAT) and other existing areas of wind shear conditions for the next 12- to 18-hour period.
2- a general forecast of areas of unstable air masses at the 300 millibar level during the next 18 hours.
3- prospects of both general and severe thunderstorm activity during the next 24 hours.
4- a forecast of low level convective activity, wind shear, and restrictions to visibility for the next 12 hours.

VALID 141200Z FOR USE 0900-1500Z. TEMPS NEG ABV 24000

FT	3000	6000	9000	12000	18000	24000	30000	34000	39000
MLT	2807	2715-07	2728-10	2842-13	2867-21	2891-38	781842	782650	780456
BOS	9900	2313-01	2525-04	2637-07	2661-16	2674-27	260641	269450	278458
EMI	1415	2118+07	2230+04	2341-01	2360-13	2469-25	247940	248649	259458
PLB	0210	9900-07	2714-09	2728-12	2656-19	2677-29	760142	760850	269658
ALB	0710	1906-01	2418-04	2532-07	2558-16	2572-27	258941	269450	269159

Figure 11

428. A certain station is forecasting wind and temperature aloft to be 280° at
N34 205 knots; temperature -51°C. at 39,000 pressure altitude. How would this data be encoded in the FD?

1- 280051
2- 2899-51
3- 789951
4- 7800-51

429. For what maximum time period is a CONVECTIVE OUTLOOK (AC) valid?
N37

1- 24 hours
2- 18 hours
3- 12 hours
4- 6 hours

430. Omission of a wind entry in a Terminal Forecast specifically implies that the
N30 wind is expected to be less than

1- 10 knots.
2- 8 knots.
3- 6 knots.
4- 5 knots.

431. If squalls are reported at your destination, what wind conditions
N15 should you anticipate?

1- Sudden increases in windspeed of at least 15 knots to a sustained speed of 20 knots or more.
2- Peak gusts of at least 35 knots for a sustained period of 1 minute or longer.
3- Rapid variation in wind direction of at least 20° and changes in speed of at least 10 knots between peaks and lulls.
4- At least 60° variation in wind direction with speeds above 25 knots.

432. What is the single source reference that contains information regarding frontal
N31 movement, turbulence, and icing conditions for a specific area?

1- 500 MB Prognostic Chart
2- Weather Depiction Chart
3- Area Forecast (FA)
4- Terminal Forecast (FT)

433. What approximate wind direction, speed, and temperature (relative to ISA) should
N34 a pilot expect when planning for a flight over EMI at FL 320? (Fig. 11)

1- 270° magnetic; 115 knots; ISA -3°C.
2- 260° true; 105 knots; ISA +5°C.
3- 270° true; 110 knots; ISA +5°C.
4- 260° magnetic; 105 knots; ISA -5°C.

434. What approximate wind direction, speed, and temperature (relative to ISA) should
N34 a pilot expect when planning for a flight over ALB at FL 320? (Fig. 11)

1- 260° magnetic @ 103 knots; ISA -5°C.
2- 270° magnetic @ 108 knots; ISA -3°C.
3- 260° true @ 110 knots; ISA +5°C.
4- 270° true @ 109 knots; ISA +3°C.

435. What approximate wind direction, speed, and temperature (relative to ISA) should
N34 a pilot expect when planning for a flight over PSB at FL 320? (Fig. 11)

1- 270° true @ 113 knots; ISA +5°C.
2- 270° magnetic @ 113 knots; ISA +3°C.
3- 270° true @ 105 knots; ISA -5°C.
4- 260° true @ 113 knots; ISA -3°C.

436. Area Forecasts (FA) are prepared by the National Weather Service every
N31

1- 3 hours.
2- 6 hours.
3- 12 hours.
4- 18 hours.

437. How often are Area Forecasts (FA) prepared by the National Weather
N31 Service?

1- 18 hours
2- 12 hours
3- 8 hours
4- 6 hours

438. Which weather forecast provides prospects of both general and
N37 severe thunderstorm activity during the following 24 hours?

1- Special flight forecast.
2- Convective Outlook (AC).
3- Stability chart.
4- Severe weather watch bulletin.

439. What cloud coverage was reported by a pilot as indicated by this SA?
N20

SA 191908
MSY M8 OVC 2RW--132/45/44/3010/
990/UA/OV 17NW MSY 1845/SK OVC
020/045 OVC 090

1- The top of the lower overcast is 2,000; base and top of second layer are 4,500 and 9,000 feet respectively.
2- Three separate overcast layers exist with bases at 2,000, 4,500, and 9,000 feet respectively.
3- The base of a second overcast cloud layer is 2,000 feet, top at 4,500 feet; base of third layer is 9,000 feet.
4- Three separate overcast layers exist with tops at 2,000, 4,500, and 9,000 feet.

440. What is the significance of the "LE30" entry in the Remarks of this SA?
N17

SA21 191105
HAR M3 OVC 2R-F 128/62/62/0000/005/
LE30→ HAR ↘ 7/15

1- Drizzle is expected to end 30 minutes past the hour.
2- Leading edge of warm front is 30 miles east of station.
3- Drizzle ended at 1030Z.
4- Lightning has been observed approximately 30 miles to the east.

441. How often are Terminal Forecasts issued, and what is the valid time period of
N30 each?

	Issued	Valid Time Period
1-	Two times daily	12 hours
2-	Every 6 hours	12 hours
3-	Three times daily	24 hours
4-	Three times daily	8 hours

442. What wind conditions would you anticipate when squalls are reported at your
N15 destination?

1- Peak gusts of at least 35 knots combined with a change in wind direction of 30° or more.
2- Sudden increases in windspeed of at least 15 knots to a sustained speed of 20 knots or more.
3- Variations of at least 60° in wind direction when windspeeds are above 10 knots.
4- Rapid variations in windspeed of 10 knots or more between peaks and lulls.

443. The reporting station originating the SA below, has a field elevation of 1,000
L45 feet MSL. If the reported sky condition is one continuous layer, what is its thickness?

W7X1/2FK 172/34/33/0000/003/OVC 50

1- 4,300 feet
2- 5,000 feet
3- 4,000 feet
4- 3,300 feet

444. What is the significance of the "F2" in the Remarks portion of this SA?
N12

SA21 191105
ORF SP -X E80 BKN 250 OVC 1GF
169/67/6721Ø5/ØØ3 RØ5VV11/2F2

1- Fog is obscuring two-tenths of the sky.
2- The partial obscuration is caused by fog and the visibility value is variable to 1 1/2 to 2 statute miles.
3- Surface based obscuration is caused by fog and is 200 feet thick.
4- The restriction to visibility is caused by fog and the prevailing visibility is 2 statute miles.

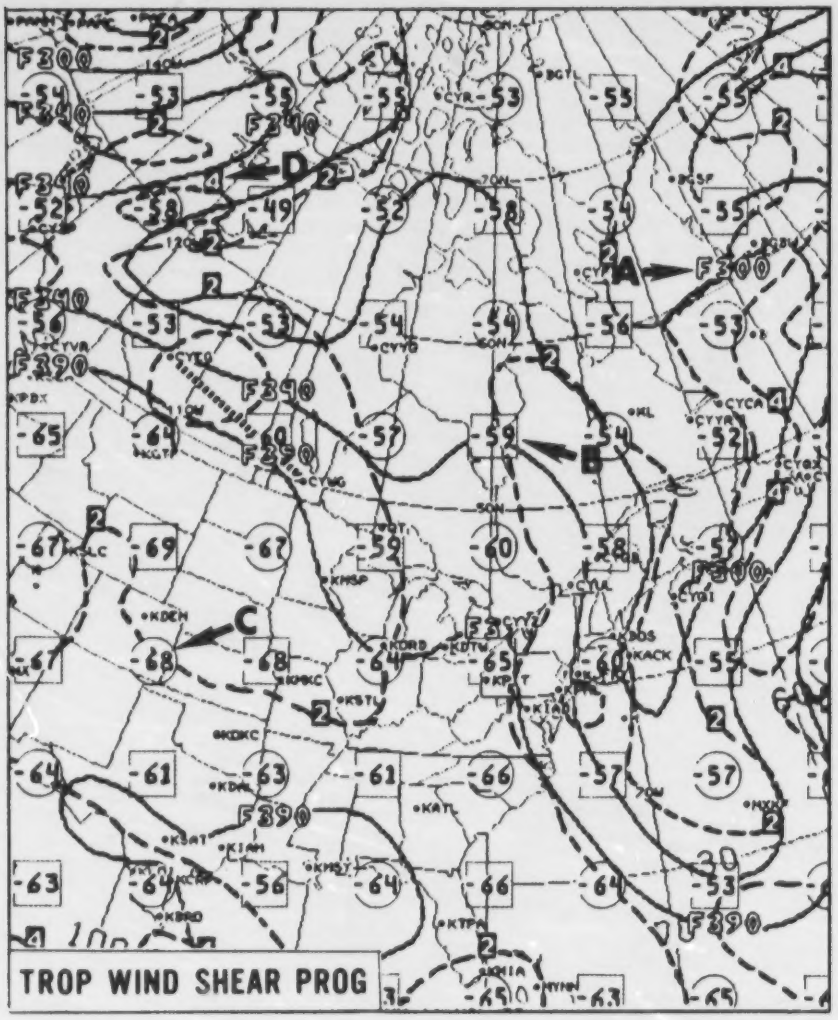


Figure 12

445. The symbol F300 on the TROP WIND SHEAR PROG represents the (Arrow A,
P22 Fig. 12)

1- height of the tropopause in millibars (300 mbar).
2- wind direction at the tropopause (300°).
3- flight level of the tropopause.
4- height of maximum wind shear (30,000 feet).

446. The symbol -59 on the TROP WIND SHEAR PROG represents the (Arrow B,
P22 Fig. 12)

1- temperature at the tropopause level.
2- 300 millibar-level temperature.
3- 150 millibar-level temperature.
4- temperature at 34,000 feet.

447. The symbol 4 on the TROP WIND SHEAR PROG (Arrow D, Fig. 12) represents the
P22

1- temperature lapse rate of 4° per 1,000 feet.
2- wind shear in knots per thousand feet.
3- temperature drop at the tropopause.
4- maximum wind shear at FL 340.

448. The symbol -68 on the TROP WIND SHEAR PROG (Arrow C, Fig. 12) represents
P22 the

1- 300 millibar-level temperature.
2- tropopause temperature.
3- 150 millibar-level temperature.
4- temperature at 30,000 feet.

449. What weather conditions are depicted on the Radar Summary Chart within the
026 area indicated by Arrow E? (Fig. 13)

1- A severe weather watch is in effect for this area; average tops of echoes are 51,000 feet; tornado activity possible.
2- Line of echoes with average tops 51,000 feet; a strong cell detected by two or more radars.
3- Area of echoes with average tops of 46,000 feet in south-central Texas and 44,000 feet in north-central Texas, and individual echo with top at 51,000 feet.
4- Line of echoes with average tops of 51,000 feet; tornado activity detected in central Texas by two or more radars.

450. What weather conditions are depicted on the Radar Summary Chart within the
026 area indicated by Arrow D? (Fig. 13)

1- Over nine-tenths coverage; thunderstorms with heavy rain showers decreasing in intensity; cell movement is to the northeast at 15 knots and area movement is to the southeast at 20 knots.
2- Six-tenths to eight-tenths coverage; thunderstorms and rain showers increasing in intensity; line movement is to the northeast at 15 knots and individual cell movement is to the southeast at 20 knots.
3- Over nine-tenths closed coverage with one isolated thunderstorm increasing in intensity and moving northeastward at 15 knots; area of cloud movement is to the southeast at 20 knots.
4- Over six-tenths coverage; thundershowers with moderate rain showers decreasing in intensity; line movement northeastward at 15 knots and individual cell movement southeastward at 10 knots.

451. What weather conditions are depicted on the Radar Summary Chart within the area
026 indicated by Arrow C? (Fig. 13)

1- Scattered rain showers decreasing in intensity; tops 35,000 feet reported by aircraft; movement of individual cells is easterly at 30 knots.
2- Tops 35,000 feet reported by aircraft; area movement easterly at 30 knots; individual cell movement northeasterly at 25 knots.
3- Scattered thunderstorms; rain showers decreasing in intensity (no change); average tops 35,000 feet.
4- Average cloud tops are 35,000 feet; thunderstorms, light rain showers; area movement northeasterly at 25 knots; individual cell movement is easterly at 30 knots.

452. What weather conditions are depicted within the area indicated by Arrow B on
026 the Radar Summary Chart in Fig. 13?

1- Widely scattered thunderstorms with area movement southeast at 15 knots; bases of echoes average 21,000 feet.
2- Very light rain showers decreasing in intensity; average tops 21,000 feet; one isolated cell detected by two radars.
3- Widely scattered echoes, average tops of echoes 21,000 feet; individual cell movement southeast at 15 knots.
4- An individual cell was detected by two weather radars; average tops of echoes are 21,000 feet; light rain showers dissipating.

453. What weather conditions are depicted on the Radar Summary Chart within the area
026 indicated by Arrow A? (Fig. 13)

1- Top of an individual cell is 33,000 feet; broken cloud condition; average tops of clouds are 47,000 feet; line movement is southeast at 25 knots.
2- Six-tenths to nine-tenths coverage; average tops of echoes are 47,000 feet; line movement is northeast at 20 knots.
3- Five-tenths to eight-tenths coverage; maximum top of one individual echo is 47,000 feet; individual cell movement is southeast at 25 knots.
4- Six-tenths to nine-tenths coverage; maximum tops of echoes are 47,000 feet; area movement is southeast at 25 knots.

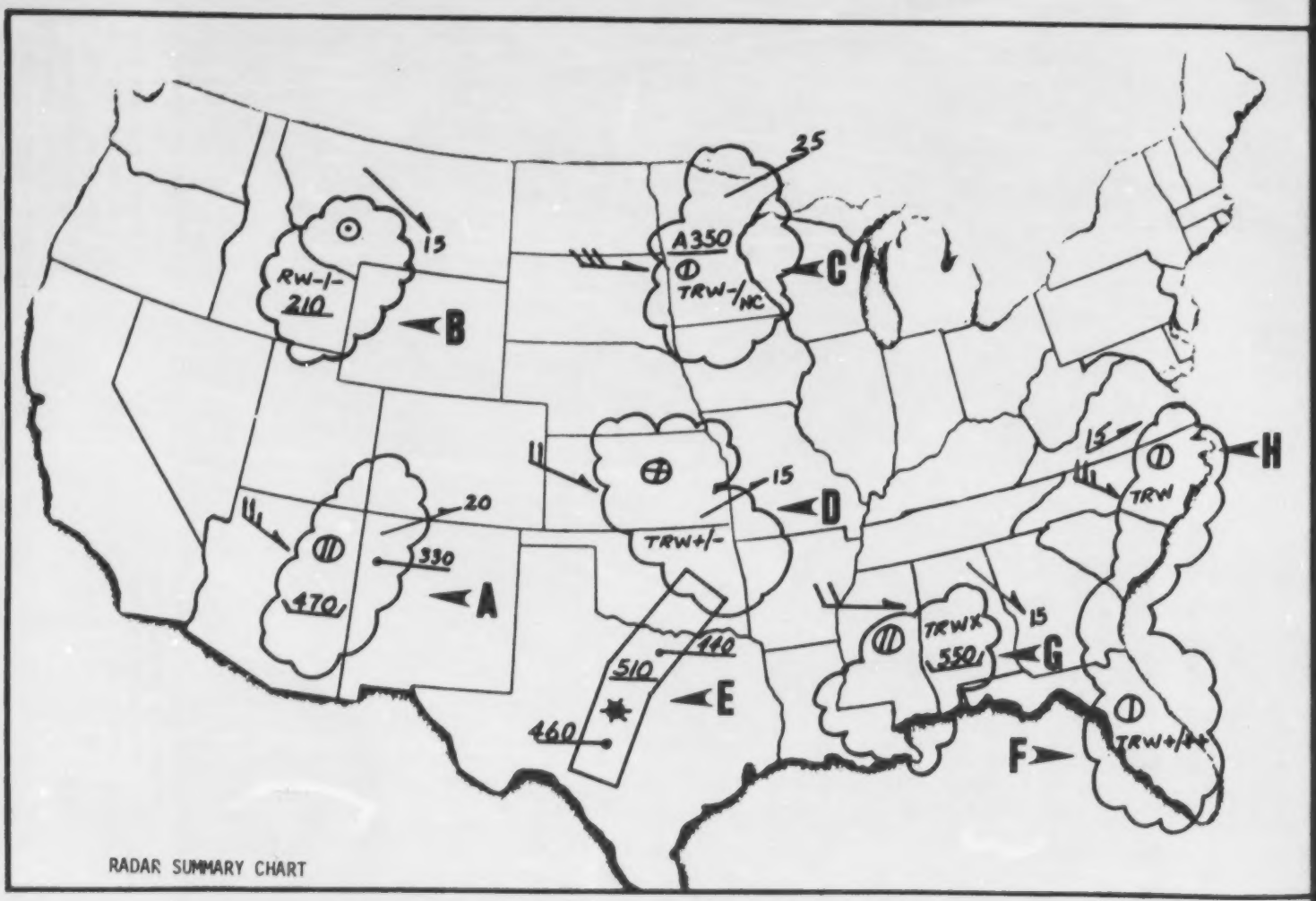

25
15
RW-I-
210
B
A350
TRW-/NC
C
20
330
470
A
15
TRW+/-
D
15
TRW
H
510
440
460
E
TRWX
550
15
G
TRW+/++
F
RADAR SUMMARY CHART

Figure 13

454. What significant weather condition is depicted in area A indicated on the HI
030 LVL SIG PROG, Fig. 15, page 60?

1- Broken cloud coverage with bases at 35,000 feet with moderate to severe turbulence.
2- Light to moderate CAT with base of turbulence at 35,000 feet.
3- Scattered cloud coverage with bases reported at 35,000 feet.
4- Moderate to severe turbulence from below 24,000 feet to 35,000 feet.

455. What is the windspeed at the station plot indicated by Arrow A? (Fig. 14)
P12

1- 40 knots
2- 65 knots
3- 30 knots
4- 55 knots

456. The station plot shown by Arrow C, Fig. 14, indicates a windspeed of
P12

1- 40 knots.
2- 60 knots.
3- 80 knots.
4- 130 knots.

457. The station plot shown by Arrow A, Fig. 14, indicates a windspeed of
P12

1- 30 knots.
2- 40 knots.
3- 55 knots.
4- 65 knots.

458. What is the significance of the clear area (Arrow B) which lies
P12 within the hatched area? (Fig. 14)

1- Windspeeds within the clear area range from 110 to 150 knots.
2- The windspeeds within the clear area range from 85 to 100 knots.
3- The clear area has lower average windspeeds than does the surrounding hatched area.
4- Windspeeds within the clear area average more than 150 knots.

459. What is the windspeed at the station plot indicated by Arrow C? (Fig. 14)
P12

1- 70 knots
2- 80 knots
3- 90 knots
4- 110 knots

460. The clear area (Arrow B) which lies within the hatched area, signifies that
P12 (Fig. 14)

1- windspeeds within the clear area range from 110 to 150 knots.
2- the clear area has lower average windspeeds than does the surrounding hatched area.
3- windspeeds within the clear area average more than 150 knots.
4- the windspeeds within the clear area range from 90 to 115 knots.

461. What weather conditions are depicted on the Radar Summary Chart within the area
026 indicated by Arrow G? (Fig. 13, page 57)

1- Top of highest echo detected is 55,000 feet; thunderstorms, rain showers, and hail detected; line movement easterly at 20 knots.
2- Broken cloud coverage with intense echo return, maximum tops at 55,000 feet; line movement easterly at 20 knots.
3- Broken echo coverage; maximum tops at 55,000 feet; intense thunderstorms and rain showers; individual cell movement is southeasterly at 15 knots.
4- Broken echo coverage; average tops at 55,000 feet; intense thunderstorms and rain showers; line movement is southeasterly at 15 knots.

462. What weather conditions are depicted on the Radar Summary Chart within the area
026 indicated by Arrow F? (Fig. 13, page 57)

1- Less than five-tenths coverage; thunderstorms with rain showers increasing in intensity.
2- Five-tenths or less cloud coverage; thunderstorms; heavy rain showers; intensity trend is for very heavy precipitation.
3- Less than four-tenths coverage; thunderstorms; heavy rain showers; thunderstorms increasing in intensity.
4- Five-tenths or less echo coverage; very strong echo intensity; thunderstorms; heavy rain showers; estimated very heavy precipitation intensity.

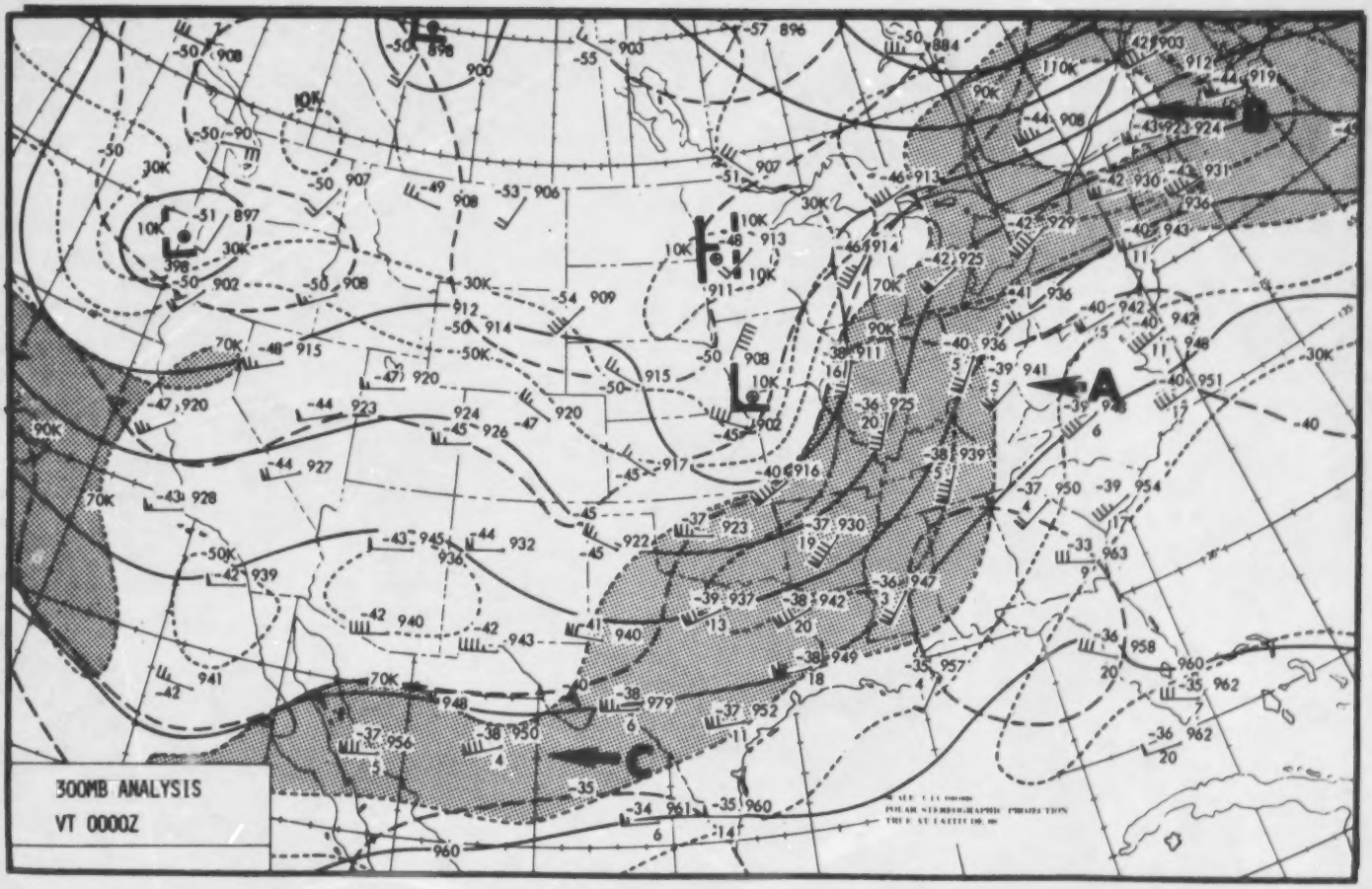


Figure 14

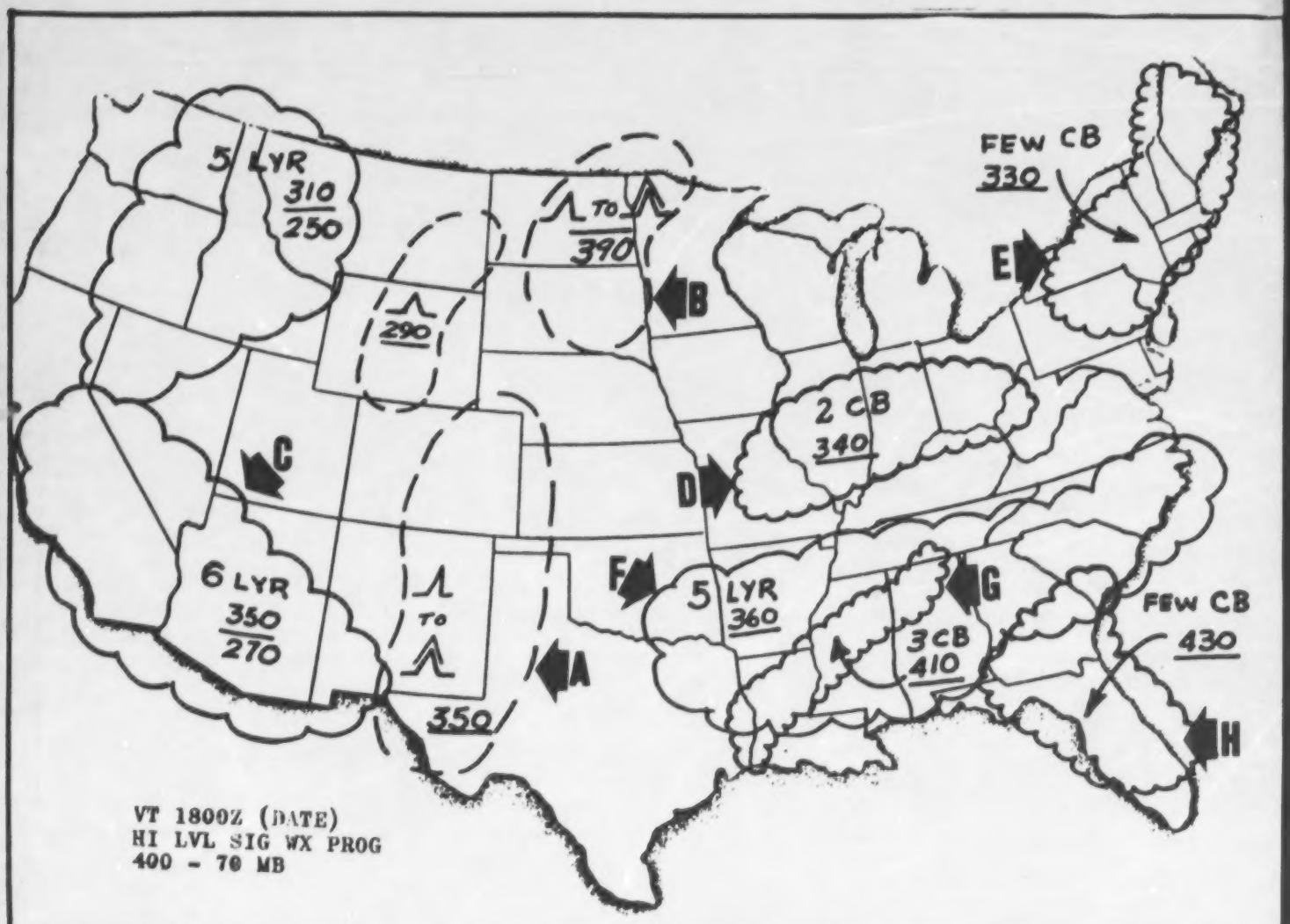

5 LYR
310
250
TO
390
290
FEW CB
330
E
B
2 CB
340
C
D
6 LYR
350
270
TO
F
5 LYR
360
G
3 CB
410
FEW CB
430
A
350
H
VT 1800Z (DATE)
HI LVL SIG WX PROG
400 - 70 MB

Figure 15

463. What type of clouds and coverage should a pilot expect within an
030 area enclosed by large-scalloped lines on a HI LVL SIG PROG chart?

1- Dense, continuous cirriform clouds of broken or overcast coverage.
2- Continuous clouds of any type which constitute an overcast condition.
3- Any intensity (light to dense) cirriform clouds of overcast coverage only.
4- Cumulonimbus or cumuliform clouds of scattered to broken coverage.

464. What significant weather condition is expected within area G on the
030 HI LVL SIG PROG, Fig. 15?

1- Three-tenths coverage, layered cirriform clouds, base at 41,000 feet.
2- Three-eighths cloud coverage, cumulonimbus, tops 41,000 feet, bases below 24,000 feet.
3- Three layers of cirrostratus, tops 41,000 feet, bases unknown.
4- Three cumulonimbus cells with average tops above 41,000 feet.

465. What significant weather condition is expected to exist in area F, as depicted
030 on the HI LVL SIG PROG? (Fig. 15)

1- Five layers (scattered coverage) tops of highest layer at 36,000 feet.
2- Five layers (broken coverage), base of lowest layer at 36,000 feet.
3- Five-eighths coverage, layered cirriform clouds, bases below 24,000 feet, tops 36,000 feet.
4- Five-tenths coverage (scattered) stratocumulus clouds, base at 36,000 feet, tops above 45,000 feet.

466. What significant weather conditions are expected after 1800Z, in area E
030 of the HI LVL SIG PROG, Fig. 15?

1- Few cirrus stratus cloud layers, overall tops average 33,000 feet.
2- Multi-layered cirriform clouds, overall bases average 33,000 feet.
3- Few (less than 1/10 coverage) towering cumulus, tops above 33,000 feet.
4- Few (less than 1/8 coverage) cumulonimbus, tops at 33,000 feet; bases are below 24,000 feet.

467. What significant weather is expected within area H on the HI LVL SIG PROG,
030 Fig. 15?

1- Less than one-tenth coverage, cirriform clouds, bases at 43,000 feet.
2- Multi-layered cirriform clouds, average bases, 43,000 feet.
3- Scattered cumuliform buildups, average tops above 43,000 feet.
4- Less than one-eighth coverage, cumulonimbus, bases below 24,000, tops above 43,000 feet.

468. What significant weather condition is expected to exist after 1800Z within
030 area D on the HI LVL SIG PROG, Fig. 15?

1- Two-tenths coverage, cirriform clouds, with tops at 34,000 feet.
2- Two layers of cumulonimbus, bases at 34,000 feet, tops at 45,000 feet.
3- Two-eighths cumulonimbus, tops at 34,000 feet.
4- Two layers of cirriform (broken) clouds, bases at 34,000 feet MSL.

469. What significant weather conditions are expected to exist within area C as
030 depicted on the HI LVL SIG PROG, Fig. 15?

1- Six-tenths coverage (broken), layered cumuliform clouds, bases at 27,000 feet, tops at 35,000 feet.
2- Six-eighths coverage (broken), layered cirriform clouds, bases at 27,000 feet, and tops at 35,000 feet.
3- Multi-layered cirriform clouds, six-tenths coverage from 27,000 feet to 35,000 feet.
4- Six layers of cirriform clouds from 27,000 feet to 35,000 feet.

470. What significant weather condition is expected to exist within area B, as
030 depicted on the HI LVL SIG PROG? (Fig. 15)

1- Moderate to severe turbulence from 39,000 feet to above 45,000 feet.
2- Light to moderate CAT from 24,000 feet to 39,000 feet.
3- Moderate to severe turbulence from 24,000 feet to 39,000 feet.
4- Light to moderate turbulence from 39,000 feet to 40,000 feet inclusive.

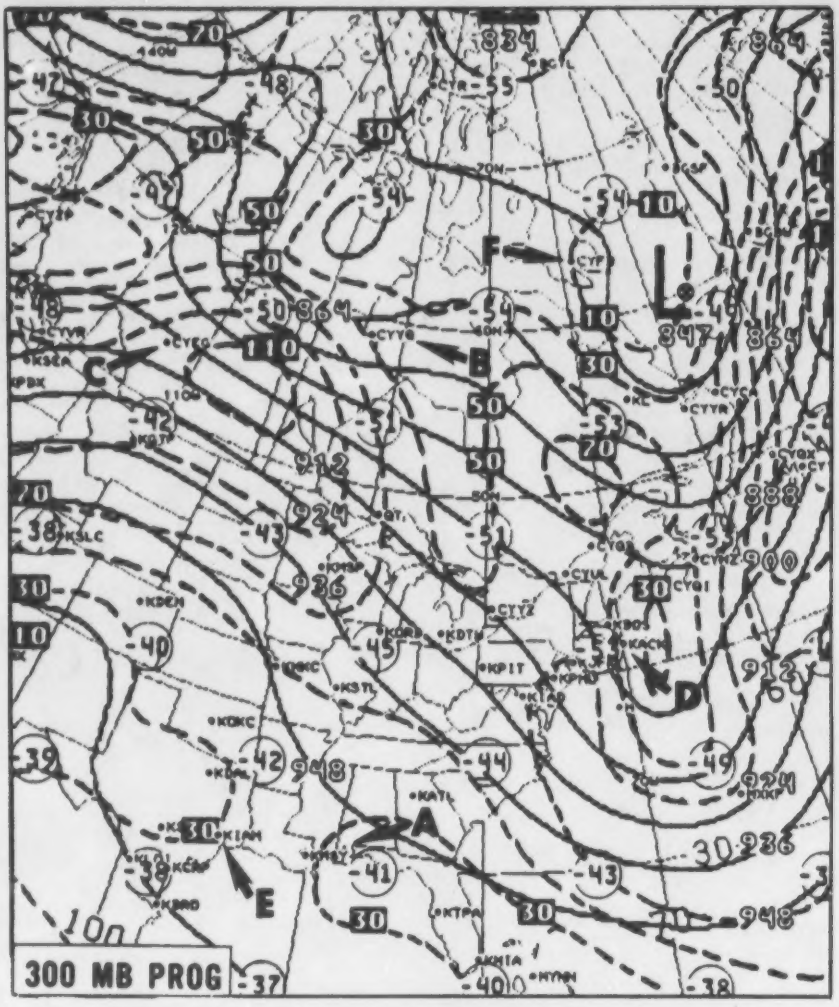


Figure 16

471. What is the approximate wind direction and velocity at CYFB? (Arrow F, Fig. 16)
P13

1- 120°/30 knots
2- 170°/10 knots
3- 300°/10 knots
4- 020°/54 knots

472. What is the approximate wind direction and velocity at KIAH? (Arrow E, Fig. 16)
P13

1- 130°/40 knots
2- 310°/30 knots
3- 170°/30 knots
4- 350°/40 knots

473. What is the approximate wind direction and velocity at KACK? (Arrow D, Fig. 16)
P13

1- 340°/50 knots
2- 180°/30 knots
3- 360°/30 knots
4- 160°/60 knots

474. What is the approximate wind direction and velocity at CYEG? (Arrow C, Fig. 16)
P13

1- 050°/50 knots
2- 230°/80 knots
3- 090°/110 knots
4- 270°/100 knots

475. What is the approximate wind direction and velocity at CYYQ? (Arrow B, Fig. 16)
P13

1- 270°/50 knots
2- 310°/84 knots
3- 150°/50 knots
4- 090°/75 knots

476. What weather conditions are depicted within the area indicated by Arrow B
026 on the Radar Summary Chart? (Fig. 17, page 64)

1- Widely scattered echo coverage, heavy rain showers decreasing in intensity; average tops of echoes 21,000 feet MSL; individual echo movement to the southeast at 15 knots.
2- Isolated cell detected by two or more radars; rain showers decreasing in intensity; top of highest echo is 21,000 feet MSL; area movement to the southeast at 15 knots.
3- Widely scattered cloud coverage, rain showers decreasing in number, average tops of clouds are 21,000 feet MSL; line movement is southeast at 15 knots.
4- Strong single cell detected by one radar; heavy rain showers decreasing in intensity, average tops of echoes 21,000 feet MSL; area movement to the southeast at 15 knots.

477. What weather conditions are depicted within the area indicated by Arrow A
026 on the Radar Summary Chart? (Fig. 17, page 64)

1- Broken echo coverage, single cell detected by two or more radars; thunderstorm decreasing in intensity, line movement to the southeast at 20 knots.
2- Broken cloud coverage, single cell detected by one radar; thunderstorm decreasing in intensity, line movement to the southeast at 20 knots.
3- Strong cell detected by two or more radars, 5/10 to 8/10 cloud coverage; thunderstorm, heavy rain shower decreasing in intensity, individual cell movement to the southeast at 20 knots.
4- Strong cell detected by one radar, 6/10 to 9/10 echo coverage; thunderstorm, heavy rain shower decreasing in intensity, area movement to the southeast at 20 knots.

478. What weather phenomenon is implied within an area enclosed by small scalloped lines
030 on a HI LVL SIG PROG chart?

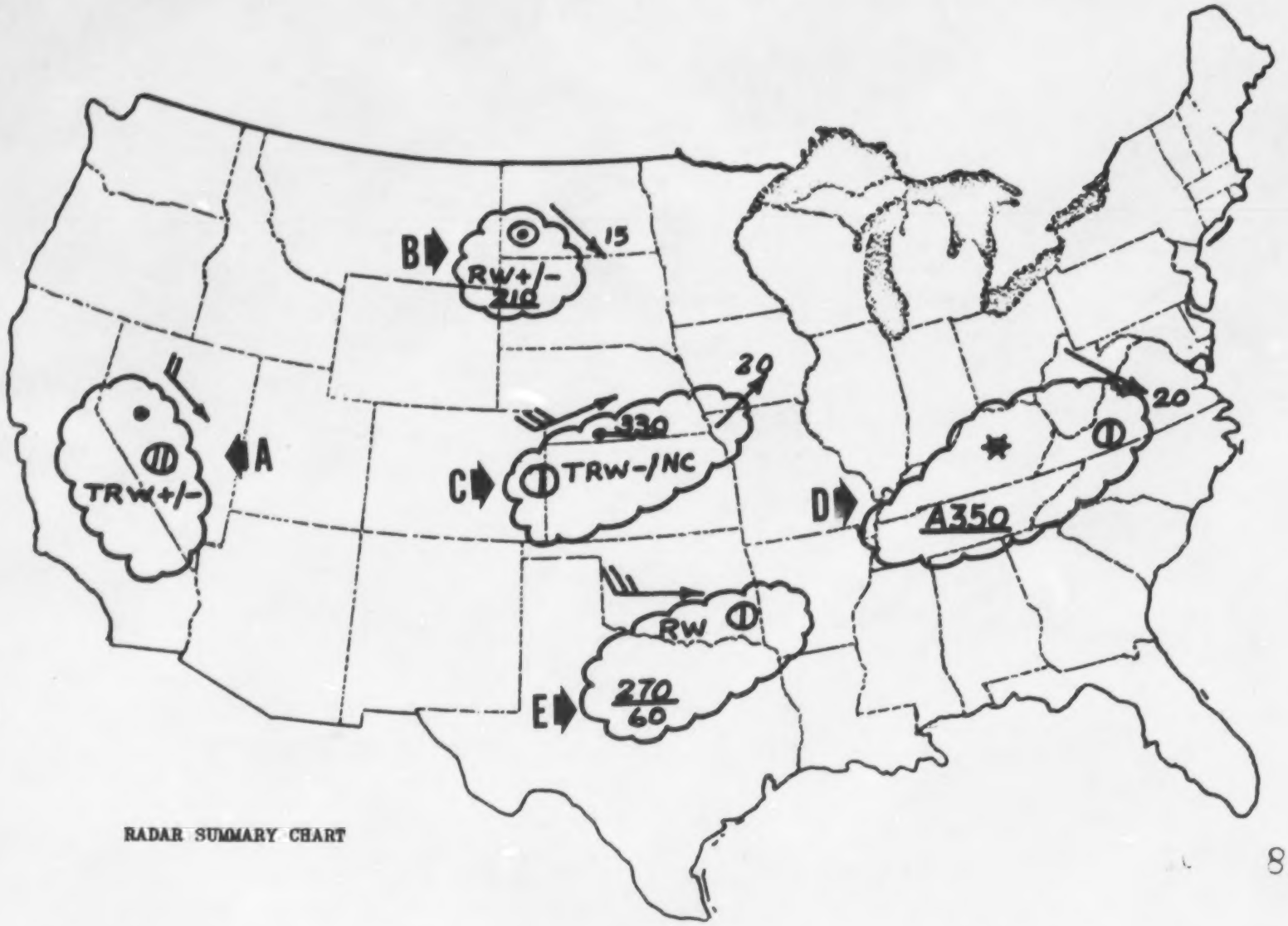
1- Cumuliform or standing lenticular clouds, moderate to severe turbulence, and icing.
2- Cumulonimbus clouds, icing, and moderate or greater turbulence.
3- Cirriform clouds, light to moderate turbulence, and icing.
4- Cirrocumulus clouds, moderate turbulence; no icing unless specifically indicated.

479. Large scalloped lines shown on a HI LVL SIG PROG chart enclose areas of
030

1- existing stratus clouds.
2- forecast dense, continuous cirriform clouds.
3- existing cirriform clouds of scattered to broken coverage.
4- forecast cumulus clouds.

480. Cumulonimbus clouds, icing, and moderate turbulence expected within an area on a
030 HI LVL SIG PROG chart are shown by

1- a large scalloped line.
2- the term CB.
3- a small scalloped line.
4- a dashed line.



RADAR SUMMARY CHART

80

81

Figure 17

481. What weather conditions are depicted within the area indicated by Arrow D
026 on the Radar Summary Chart? (Fig. 17)

1- Strong cell detected by two or more radars; average tops of echoes are 35,000 feet AGL; individual echo movement to the southeast at 20 knots.
2- Strong cell detected by one radar; scattered echo coverage; bases at 3,500 feet MSL reported by aircraft; individual cell movement to the southeast at 20 knots.
3- Scattered echo coverage, strong cell detected by two or more radars; echo tops at 35,000 feet MSL reported by aircraft; individual cell movement to the southeast at 20 knots.
4- Single cell detected by one radar, scattered cloud coverage, average tops of echoes are 35,000 feet MSL; line or area movement to the southeast at 20 knots.

482. What weather conditions are depicted within the area indicated by Arrow C
026 on the Radar Summary Chart? (Fig. 17)

1- Widely scattered echo coverage, thunderstorm, light rain shower (no change); top of an individual echo is 33,000 feet MSL; area movement to the east at 30 knots, and individual cell movement to the northeast at 20 knots.
2- Scattered echo coverage, thunderstorm and rain showers of light intensity (no change); top of individual cell is 33,000 feet MSL; area movement to the northeast at 30 knots, and individual cell movement to the northeast at 20 knots.
3- Scattered cloud coverage; thunderstorm, light rain shower (no change), tops of height echo are 33,000 feet MSL; area movement to the northeast at 20 knots, and individual cell movement to the east at 30 knots.
4- Widely scattered cloud coverage, light rain shower (no change), average tops of echoes are 33,000 feet MSL; line movement to the east at 15 knots, and individual cell movement is northeast at 20 knots.

483. What weather conditions are depicted within the area indicated by Arrow E
026 on the Radar Summary Chart? (Fig. 17)

1- Scattered echo coverage, moderate rain showers, area movement to the east at 25 knots, and bases and tops of echoes are 6,000 and 27,000 feet respectively.
2- Widely scattered echoes, moderate rain showers, individual cell movement to the east at 25 knots, bases and tops of clouds are 6,000 and 27,000 feet respectively.
3- Scattered echo coverage, light rain showers, individual cell and area movement to the east at 25 knots, bases and tops of clouds are 6,000 and 27,000 feet respectively.
4- Widely scattered clouds with moderate rain showers; area movement to the east at 30 knots, bases and tops of clouds are 6,000 to 27,000 feet MSL respectively.

484. What weather conditions are depicted within the area indicated by Arrow B?
030 (Fig. 18, page 66)

1- Scattered cirriform clouds between 25,000 and 30,000 feet with light to moderate turbulence.
2- Moderate to severe turbulence from 25,000 to 30,000 feet.
3- Light to moderate turbulence at 25,000 and 30,000 feet respectively.
4- Moderate to severe turbulence at 25,000 and 30,000 feet respectively.

485. What weather conditions are depicted within the area indicated by Arrow A?
030 (Fig. 18, page 66)

1- Few (less than one-tenth coverage) cumulonimbus, tops below 33,000 feet.
2- Few (less than one-eighth coverage) cumulonimbus, bases at 33,000 feet.
3- Few cirriform clouds with bases at 33,000 feet.
4- Few cumuliform clouds, tops above 33,000 feet.

486. What weather conditions are depicted within the area indicated by Arrow G?
030 (Fig. 18)

1- Three-eighths coverage; multiple layers of stratiform clouds from 25,000 to 35,000 feet.
2- Three-tenths coverage; three layers cirriform clouds from 25,000 to 35,000 feet.
3- Three layers cumuliform clouds between 25,000 and 35,000 feet.
4- Three-eighths coverage; layered cirriform clouds; bases and tops at 25,000 and 35,000 feet respectively.

487. What weather conditions are depicted within the area indicated by Arrow F?
030 (Fig. 18)

1- Three layers cirriform clouds top of highest layer is 34,000 feet.
2- Three-eighths coverage; layered cirriform clouds; bases below 24,000 feet and tops 34,000 feet.
3- Three layers cumulonimbus clouds; base of lowest layer 34,000 feet; top of highest layer undetermined.
4- Three-tenths coverage; layered cirriform clouds; bases at 34,000 feet.

488. What type of clouds and coverage should a pilot expect within an area
030 enclosed by large-scalloped lines on a HI LVL SIG PROG chart?

1- Any intensity (light to dense) cirriform clouds of overcast coverage only.
2- Continuous clouds of any type which constitute an overcast condition.
3- Dense, continuous cirriform clouds of broken or overcast coverage.
4- Cumulonimbus or cumuliform clouds of scattered to broken coverage.

489. What weather conditions are depicted within the area indicated by Arrow E?
030 (Fig. 18)

1- Moderate to severe turbulence from below 24,000 feet to 29,000 feet.
2- Severe to extreme turbulence from 20,000 feet to 39,000 feet.
3- Moderate to severe turbulence starting at 29,000 feet.
4- Light to moderate turbulence from 29,000 feet to undetermined height.

490. What weather phenomenon is implied within an area enclosed by small scalloped lines
030 on a HI LVL SIG PROG chart?

1- Cumulonimbus clouds, icing, and moderate or greater turbulence.
2- Cirriform clouds, light to moderate turbulence, and icing.
3- Cirrocumulus clouds; moderate turbulence; no icing unless specifically indicated.
4- Cumuliform or standing lenticular clouds, moderate to severe turbulence, and icing.

491. What weather conditions are depicted within the area indicated by Arrow D?
030 (Fig. 18)

1- Scattered (less than one-tenth coverage) cumuliform; bases at 24,000 feet and tops at 40,000 feet.
2- Few (less than one-tenth coverage) cumulonimbus; tops at 40,000 feet.
3- Few (less than one-eighth coverage) cumulonimbus; tops at 40,000 feet and bases below 24,000 feet.
4- Broken (more than six-eighths coverage) cirriform; bases at 40,000 feet.

492. What weather conditions are depicted within the area indicated by Arrow C?
030 (Fig. 18)

1- Six separate layers of cirriform clouds with bases at 26,000 feet and tops at 30,000 feet.
2- Six-tenths coverage (broken) cumuliform clouds (layered) with bases and tops at 26,000 and 30,000 feet respectively.
3- Six layers of cumuliform clouds between 26,000 and 30,000 feet with light to moderate turbulence.
4- Six-eighths coverage (broken) layered cirriform clouds; bases and tops at 26,000 and 30,000 feet respectively.

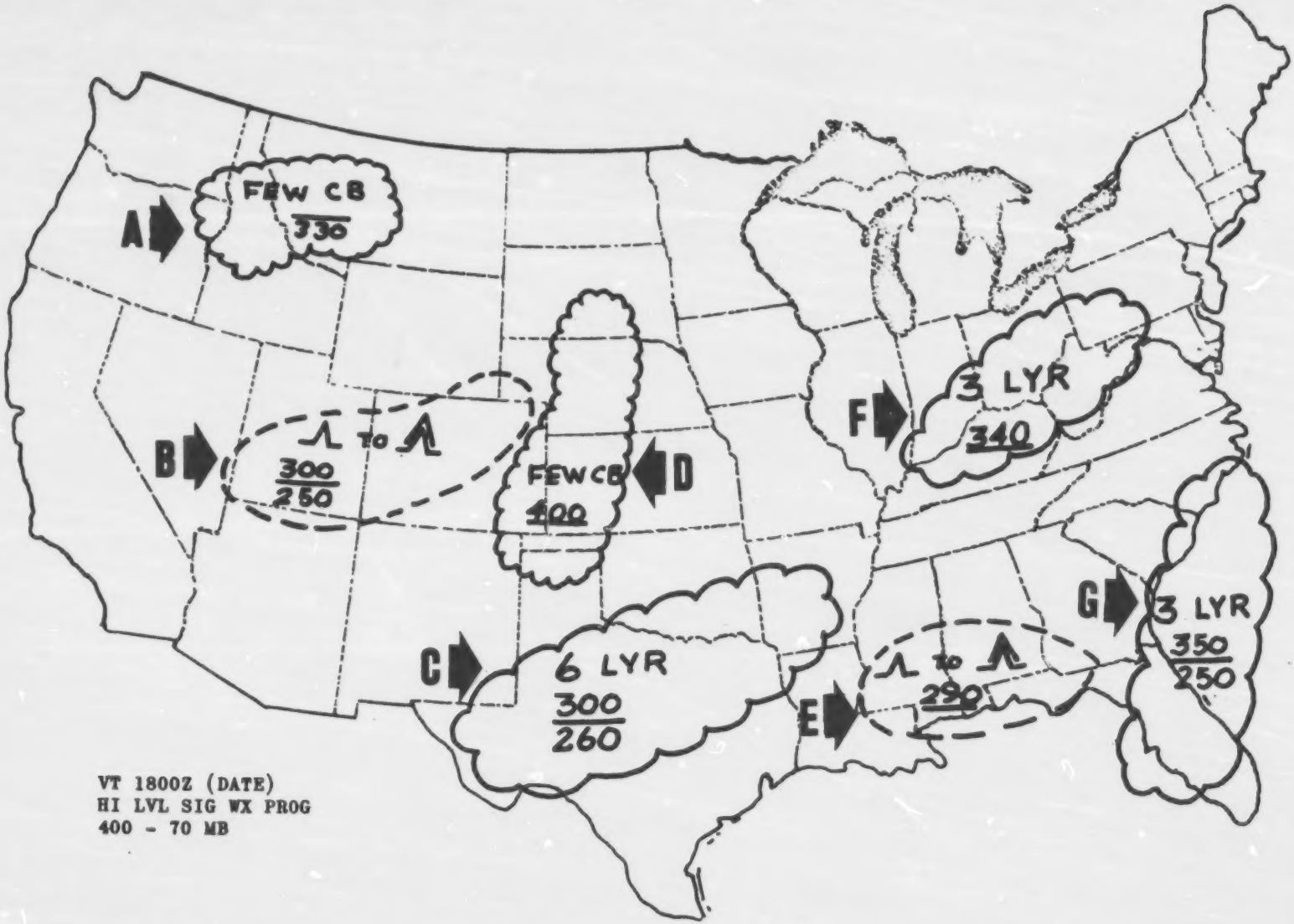

A
FEW CB
330
B
FL to FL
300
250
FEW CB
400
D
C
6 LYR
300
260
E
FL to FL
290
F
3 LYR
340
G
3 LYR
350
250
VT 1800Z (DATE)
HI LVL SIG WX PROG
400 - 70 MB

Figure 18

493. What type of clouds should a pilot expect within an area enclosed by
030 large scalloped lines on a HI LVL SIG PROG chart?

1- Nimbostratus
2- Cirrus
3- Cumulonimbus
4- Cirriform

494. What type of clouds should a pilot expect in the area enclosed by a
030 small scalloped line on the HI LVL SIG PROG chart?

1- Cirrostratus
2- Cumulonimbus
3- Nimbostratus
4- Cirriform

495. What is the maximum allowable weight that may be carried on a pallet which
W15 has dimensions of 76 x 76 inches?

Floor load limit - - 184 lbs./sq. ft.
Pallet weight- - - - 85 lbs.
Tiedown devices- - - 36 lbs.

1- 7,499 pounds
2- 7,378 pounds
3- 7,293 pounds
4- 7,257 pounds

496. What is the maximum allowable weight that may be carried on a pallet which
W15 has dimensions of 83 x 95 inches?

Floor load limit - - 169 lbs./sq. ft.
Pallet weight- - - - 88 lbs.
Tiedown devices- - - 37 lbs.

1- 9,119 pounds
2- 9,156 pounds
3- 9,244 pounds
4- 9,369 pounds

497. What is the maximum allowable weight that may be carried on a pallet which
W15 has dimensions of 76 x 74 inches?

Floor load limit - - 180 lbs./sq. ft.
Pallet weight- - - - 82 lbs.
Tiedown devices- - - 31 lbs.

1- 6,907 pounds
2- 6,947 pounds
3- 7,029 pounds
4- 7,142 pounds

498. What is the maximum allowable weight that may be carried on a pallet which has
W15 dimensions of 81 x 83 inches?

Floor load limit - - 176 lbs./sq. ft.
Pallet weight- - - - 77 lbs.
Tiedown devices- - - 29 lbs.

1- 8,325 pounds
2- 8,219 pounds
3- 8,142 pounds
4- 8,113 pounds

499. What is the maximum allowable weight that may be carried on a pallet which has
W15 dimensions of 84 x 84 inches?

Floor load limit - - 186 lbs./sq. ft.
Pallet weight- - - - 93 lbs.
Tiedown devices- - - 39 lbs.

1- 8,982 pounds
2- 9,021 pounds
3- 9,114 pounds
4- 9,246 pounds

500. What is the maximum allowable weight that may be carried on a pallet which
W15 has dimensions of 84 x 76 inches?

Floor load limit - - 184 lbs./sq. ft.
Pallet weight- - - - 77 lbs.
Tiedown devices- - - 31 lbs.

1- 8,043 pounds
2- 8,074 pounds
3- 8,151 pounds
4- 8,259 pounds

501. What is the maximum allowable weight that may be carried on a pallet which
W15 has dimensions of 72 x 72 inches?

Floor load limit - - 179 lbs./sq.ft.
Pallet weight- - - - 91 lbs.
Tiedown devices- - - 36 lbs.

1- 6,571 pounds
2- 6,444 pounds
3- 6,353 pounds
4- 6,317 pounds

502. How far will the CG shift, if 1,000 pounds of cargo are moved from the aft
W14 compartment to the forward compartment?

Airplane gross weight--155,000 pounds
CG prior to shift--1,000 in. aft of datum
Arm of fwd compartment--670 in. aft of datum
Arm of aft compartment--1,166 in. aft of datum

1- 3.2 inches
2- 2.5 inches
3- 2.0 inches
4- 1.5 inches

503. An airplane with a gross weight of 185,500 pounds has its CG located at
W14 980 inches aft of datum. The arm of the forward hold is 440 inches; the aft cargo hold is 1,150 inches. If 600 pounds of cargo are shifted from the aft hold to the forward hold, how far will the new CG shift forward?

1- 1.27 inches
2- 2.29 inches
3- 3.00 inches
4- 3.56 inches

504. An airplane's gross weight is 170,500 pounds and the CG is at 980 inches aft
W14 of datum. The arm of the forward cargo hold is 430 inches, and the arm of the aft cargo hold is 1,130 inches. If 800 pounds of cargo are shifted from the forward hold to the aft hold, how far will the CG shift aft?

1- 4.01 inches
2- 3.28 inches
3- 2.38 inches
4- 1.87 inches

505. What should be the new CG location if 800 pounds of cargo are moved from the
W14 forward cargo hold to the aft cargo hold?

Airplane gross weight--150,000 lbs.
CG prior to shift--998.0 in. aft of datum
Arm of forward hold--667.0 in. aft of datum
Arm of aft hold--1,160 in. aft of datum

1- 1000.6 inches
2- 996.0 inches
3- 994.8 inches
4- 994.0 inches

506. What should be the new CG location if 1,000 pounds of cargo are moved from
W14 the aft compartment to the forward compartment?

Airplane gross weight--155,000 pounds
CG prior to shift--1,000 in. aft of datum
Arm of forward compartment--670 in. aft of datum
Arm of aft compartment--1,166 in. aft of datum

1- 998.5 inches
2- 998.0 inches
3- 997.5 inches
4- 996.8 inches

507. What is the maximum allowable weight that may be carried on a pallet which
W15 has dimensions of 80 x 80 inches?

Floor load limit - - 185 lbs./sq. ft.
Pallet weight- - - - 81 lbs.
Tiedown devices- - - 30 lbs.

1- 8,103 pounds
2- 8,133 pounds
3- 8,214 pounds
4- 8,325 pounds

508. What is the maximum allowable weight that may be carried on a pallet which
W15 has dimensions of 70 x 70 inches?

Floor load limit - - 173 lbs./sq. ft.
Pallet weight- - - - 79 lbs.
Tiedown devices- - - 35 lbs.

1- 5,768 pounds
2- 5,807 pounds
3- 5,886 pounds
4- 6,000 pounds

509. What is the maximum allowable weight that may be carried on a pallet which
W15 has dimensions of 72 x 84 inches?

Floor load limit - - 177 lbs./sq. ft.
Pallet weight- - - - 87 lbs.
Tiedown devices- - - 29 lbs.

1- 7,550 pounds
2- 7,434 pounds
3- 7,347 pounds
4- 7,318 pounds

510. How far will the CG shift if 800 pounds of cargo are moved from the forward
W14 cargo hold to the aft cargo hold?

Airplane gross weight--150,000 lbs.
CG prior to shift--998.0 in. aft of datum
Arm of forward hold--667.0 in. aft of datum
Arm of aft hold--1,160 in. aft of datum

1- 4.0 inches
2- 3.2 inches
3- 2.6 inches
4- 1.8 inches

PASSENGER LOADING TABLE

Number of Pass.	Weight Lbs.	Moment / 1000
FORWARD COMPARTMENT CENTROID—582.0		
5	850	495
10	1,700	989
15	2,550	1,484
20	3,400	1,979
25	4,250	2,473
29	4,930	2,869
AFT COMPARTMENT CENTROID—1028.0		
10	1,700	1,748
20	3,400	3,495
30	5,100	5,243
40	6,800	6,990
50	8,500	8,738
60	10,200	10,486
70	11,900	12,233
80	13,600	13,980
90	15,300	15,728
100	17,000	17,476
110	18,700	19,223
120	20,400	20,971
133	22,610	23,243

CARGO LOADING TABLE

	Moment / 1000	
	Forward Hold	Aft Hold
Weight Lbs.	Arm 680.0	Arm 1168.0
6,000		6,966
5,000	3,400	5,830
4,000	2,720	4,664
3,000	2,040	3,498
2,000	1,360	2,332
1,000	680	1,166
900	612	1,049
800	544	933
700	476	816
600	408	700
500	340	583
400	272	466
300	204	350
200	136	233
100	68	117

NOTE: THESE COMPUTATIONS ARE TO BE USED FOR TESTING PURPOSES ONLY.

FUEL LOADING TABLE

TANKS 1 & 3 (EACH)			TANK 2 (3 CELL)					
Weight Lbs.	Arm	Moment / 1000	Weight Lbs.	Arm	Moment / 1000	Weight Lbs.	Arm	Moment / 1000
8,500	992.1	8,433	8,500	917.5	7,799	22,500	914.5	20,576
9,000	993.0	8,937	9,000	917.2	8,255	23,000	914.5	21,034
9,500	993.9	9,442	9,500	917.0	8,711	23,500	914.4	21,488
10,000	994.7	9,947	10,000	916.8	9,168	24,000	914.3	21,943
10,500	995.4	10,451	10,500	916.6	9,624	24,500	914.3	22,400
11,000	996.1	10,957	11,000	916.5	10,082	25,000	914.2	22,855
11,500	996.8	11,463	11,500	916.3	10,537	25,500	914.2	23,312
12,000	997.5	11,970	12,000	916.1	10,993	26,000	914.1	23,767
FULL CAPACITY			**(See note at lower left)			26,500	914.1	24,244
**Note: Computations for Tank 2 weights for 12,500 lbs. to 18,000 lbs. have been purposely omitted.			18,500	915.1	16,929	27,000	914.0	24,678
			19,000	915.0	17,385	27,500	913.9	25,132
			19,500	914.9	17,841	28,000	913.9	25,589
			20,000	914.9	18,298	28,500	913.8	26.043
			20,500	014.8	18,753	29,000	913.7	26,497
			21,000	914.7	19,209	29,500	913.7	26,954
			21,500	914.6	19,664	30,000	913.6	27,408
			22,000	914.6	20,121	FULL CAPACITY		

Figure 19

AIRPLANE DATUM CONSTANTS

MAC	180.9 inches
L.E. of MAC	860.5 inches
Basic Operating Index	92,837.0 / 1,000

OPERATING LIMITATIONS

Maximum Takeoff Slope	± 2%
Maximum Takeoff/Landing Crosswind Component	32 knots
Maximum Takeoff/Landing Tailwind Component	12 knots

WEIGHT LIMITATIONS

Basic Operating Weight	105,500 pounds
Maximum Zero Fuel Weight	138,500 pounds
Maximum Taxi Weight	185,700 pounds
Maximum Takeoff Weight (Brake Release)	184,700 pounds
Maximum Inflight Weight (Flaps 30)	155,500 pounds
(Flaps 40)	144,000 pounds
Maximum Landing Weight (Flaps 30)	155,000 pounds
(Flaps 40)	143,000 pounds

Figure 20

WEIGHT AND BALANCE LOAD DATA

LOAD CONDITIONS	A-1	A-2	A-3	A-4	A-5
Passengers:					
Forward compartment	27	24	19	26	28
Aft compartment	79	93	74	81	101
Cargo: (pounds)					
Forward hold	2,500	2,000	2,200	2,300	2,150
Aft hold	2,000	1,800	1,900	1,400	800
Fuel: (pounds)					
Tanks 1 & 3 (ea. tank)	FULL	FULL	FULL	12,000	FULL
Tank 2	12,000	FULL	24,000	23,500	FULL

Figure 21

511. What should be the CG in inches aft of datum for Load Conditions A-4?
W13 (Fig. 19, 20, and 21)

1- 1105.6 inches
2- 904.5 inches
3- 900.7 inches
4- 891.4 inches

512. Determine the CG in inches aft of datum for Load Conditions A-1.
W13 (Fig. 19, 20, and 21)

1- 1106.0 inches
2- 971.0 inches
3- 904.0 inches
4- 899.0 inches

513. Determine the CG in percent of MAC for Load Conditions A-3. (Fig. 19, 20, and
W13 21)

1- 25.6% MAC
2- 21.4% MAC
3- 19.8% MAC
4- 13.4% MAC

514. Determine the CG in inches aft of LEMAC for Load Conditions A-2. (Fig. 19, 20,
W13 and 21)

1- 241.2 inches
2- 165.3 inches
3- 55.4 inches
4- 47.1 inches

WEIGHT AND BALANCE LOAD DATA

LOAD CONDITIONS	B-1	B-2	B-3	B-4	B-5
Passengers:					
Forward compartment	17	28	18	16	18
Aft compartment	61	122	83	59	69
Cargo: (pounds)					
Forward hold	4,050	2,050	2,000	2,150	2,000
Aft hold	2,200	2,100	1,900	1,700	1,800
Fuel: (pounds)					
Tanks 1 & 3 (ea. tank)	10,000	10,500	10,500	11,500	11,500
Tank 2	25,500	28,500	27,500	26,500	27,000

Figure 22

515. What should be the CG in inches aft of LEMAC for Load Conditions A-5?
W13 (Fig. 19, page 70; Fig. 20 and 21, page 71)

1- 49.0 inches
2- 46.9 inches
3- 45.2 inches
4- 43.1 inches

516. Determine the CG in inches aft of datum for Load Conditions B-1.
W13 (Fig. 19, page 70; Fig. 20, page 71; Fig. 22)

1- 905.6 inches
2- 903.1 inches
3- 901.4 inches
4- 897.6 inches

517. What is the CG in percent of MAC for Load Conditions B-2? (Fig. 19,
W13 page 70; Fig. 20, page 71; Fig. 22)

1- 28.2% MAC
2- 26.4% MAC
3- 24.6% MAC
4- 23.1% MAC

518. Determine the CG in inches aft of LEMAC for Load Conditions B-3.
W13 (Fig. 19, page 70; Fig. 20, page 71; Fig. 22)

1- 46.1 inches
2- 49.0 inches
3- 50.1 inches
4- 906.6 inches

519. What should be the CG in inches aft of datum for Load Conditions B-4?
W13 (Fig. 19, page 70; Fig. 20, page 71; Fig. 22)

1- 1105.6 inches
2- 1000.3 inches
3- 989.2 inches
4- 905.3 inches

520. Determine the CG in percent of MAC for Load Conditions B-5. (Fig. 19,
W13 page 70; Fig. 20, page 71; Fig. 22)

1- 30.1% MAC
2- 28.9% MAC
3- 27.2% MAC
4- 25.1% MAC

WEIGHT AND BALANCE LOAD DATA

LOAD CONDITIONS	C -1	C -2	C -3	C -4	C-5
Passengers:					
Forward compartment	FULL	22	26	28	29
Aft compartment	118	119	134	113	97
Cargo: (pounds)					
Forward hold	3,650	3,400	2,950	3,300	3,650
Aft hold	3,000	3,300	1,800	2,900	3,000
Fuel: (pounds)					
Tanks 1 & 3 (ea. tank)	FULL	9,500	10,000	11,000	10,500
Tank 2	18,500	28,500	23,500	28,000	23,500

Figure 23

521. Determine the CG in percent of MAC for Load Conditions C-1. (Fig. 19, page 70; Fig. 20, page 71; Fig. 23)
W13

1- 47.8% MAC
2- 38.4% MAC
3- 31.2% MAC
4- 26.4% MAC

522. Determine the CG in inches aft of LEMAC for Load Conditions C-2.
W13 (Fig. 19, page 70; Fig. 20, page 71; Fig. 23)

1- 48.2 inches
2- 52.9 inches
3- 907.8 inches
4- 908.7 inches

523. Determine the CG in inches aft of LEMAC for Load Conditions C-3.
W13 (Fig. 19, page 70; Fig. 20, page 71; Fig. 23)

1- 908.1 inches
2- 49.2 inches
3- 47.6 inches
4- 44.4 inches

524. Determine the CG in inches aft of datum for Load Conditions C-4.
W13 (Fig. 19, page 70; Fig. 20, page 71; Fig. 23)

1- 901.2 inches
2- 907.4 inches
3- 1061.2 inches
4- 1102.0 inches

525. Determine the CG in percent of MAC for Load Conditions C-5. (Fig. 19, page 70; Fig. 20, page 71; Fig. 23)
W13

1- 29.1% MAC
2- 27.3% MAC
3- 24.2% MAC
4- 22.4% MAC

WEIGHT AND BALANCE LOAD DATA

LOAD CONDITIONS	D -1	D-2	D-3	D -4	D-5
Passengers:					
Forward compartment	23	11	28	21	16
Aft compartment	105	93	113	99	111
Cargo: (pounds)					
Forward hold	2,350	4,150	3,350	3,100	2,250
Aft hold	3,000	2,700	3,100	2,800	2,200
Fuel: (pounds)					
Tanks 1 & 3 (ea. tank)	FULL	10,500	FULL	11,000	11,500
Tank 2	24,500	FULL	25,000	25,500	26,500

Figure 24

526. Determine the CG in inches aft of LEMAC for Load Conditions D-1.
W13 (Fig. 19, page 70; Fig. 20, page 71; Fig. 24)

1- 47.9 inches
2- 50.0 inches
3- 905.1 inches
4- 910.5 inches

527. Determine the CG in inches aft of datum for Load Conditions D-2.
W13 (Fig. 19, page 70; Fig. 20, page 71; Fig. 24)

1- 47.9 inches
2- 896.4 inches
3- 900.1 inches
4- 908.4 inches

528. Determine the CG in percent of MAC for Load Conditions D-3.
W13 (Fig. 19, page 70; Fig. 20, page 71; Fig. 24)

1- 22.2% MAC
2- 26.6% MAC
3- 31.4% MAC
4- 37.5% MAC

529. Determine the CG in inches aft of LEMAC for Load Conditions D-4.
W13 (Fig. 19, page 70; Fig. 20, page 71; Fig. 24)

1- 908.0 inches
2- 51.3 inches
3- 47.5 inches
4- 43.4 inches

530. Determine the CG in inches aft of datum for Load Conditions D-5.
W13 (Fig. 19, page 70; Fig. 20, page 71; Fig. 24)

1- 903.4 inches
2- 911.9 inches
3- 1051.2 inches
4- 1096.6 inches

WEIGHT AND BALANCE LOAD DATA

LOAD CONDITIONS	E-1	E-2	E-3	E-4	E-5
Passengers:					
Forward compartment	22	21	27	FULL	FULL
Aft compartment	63	132	119	106	FULL
Cargo: (pounds)					
Forward hold	2,300	4,150	2,950	3,900	4,100
Aft hold	2,000	3,700	2,200	3,400	3,000
Fuel: (pounds)					
Tanks 1 & 3 (ea. tank)	11,000	10,500	10,000	9,500	11,500
Tank 2	23,500	22,500	27,500	24,500	22,500

Figure 25

531. Determine the CG in percent of MAC for Load Conditions E-1. (Fig. 19, page 70; Fig. 20, page 71; Fig. 25)
W13

1- 22.9% MAC
2- 23.6% MAC
3- 25.1% MAC
4- 26.3% MAC

532. Determine the CG in percent of MAC for Load Conditions E-2. (Fig. 19, page 70; Fig. 20, page 71; Fig. 25)
W13

1- 31.0% MAC
2- 30.1% MAC
3- 28.0% MAC
4- 26.1% MAC

533. Determine CG in percent of MAC for Load Conditions E-3. (Fig. 19, page 70; Fig. 20, page 71; Fig. 25)
W13

1- 29.5% MAC
2- 27.5% MAC
3- 25.5% MAC
4- 23.5% MAC

534. Determine the CG in percent of MAC for Load Conditions E-4. (Fig. 19, page 70; Fig. 20, page 71; Fig. 25)
W13

1- 26.2% MAC
2- 24.3% MAC
3- 22.8% MAC
4- 21.0% MAC

535. Determine the CG in percent of MAC for Load Conditions E-5. (Fig. 19, page 70; Fig. 20, page 71; Fig. 25)
W13

1- 31.2% MAC
2- 29.1% MAC
3- 26.7% MAC
4- 24.3% MAC

WEIGHT AND BALANCE LOAD DATA

LOAD CONDITIONS	F-1	F-2	F-3	F-4	F-5
Passengers:					
Forward compartment	23	18	13	17	29
Aft compartment	77	53	59	64	123
Cargo: (pounds)					
Forward hold	4,550	3,150	2,550	1,050	2,150
Aft hold	3,500	2,100	900	800	900
Fuel: (pounds)					
Tanks 1 & 3 (ea. tank)	11,000	9,500	10,000	10,500	11,500
Tank 2	24,500	24,500	24,000	26,000	28,000

Figure 26

536. Determine the CG in percent of MAC for Load Conditions F-1. (Fig. 19, page 70; Fig. 20, page 71; Fig. 26)
W13

1- 41.5% MAC
2- 36.9% MAC
3- 24.0% MAC
4- 20.4% MAC

537. Determine the CG in inches aft of LEMAC for Load Conditions F-2. (Fig. 19, page 70; Fig. 20, page 71; Fig. 26)
W13

1- 39.9 inches
2- 37.6 inches
3- 35.1 inches
4- 900.4 inches

538. Determine the CG in inches aft of datum for Load Conditions F-3. (Fig. 19, page 70; Fig. 20, page 71; Fig. 26)
W13

1- 920.3 inches
2- 916.1 inches
3- 912.6 inches
4- 902.3 inches

539. Determine the CG in percent of MAC for Load Conditions F-4. (Fig. 19, page 70; Fig. 20, page 71; Fig. 26)
W13

1- 26.0% MAC
2- 24.1% MAC
3- 22.2% MAC
4- 21.4% MAC

540. Determine the CG in inches aft of LEMAC for Load Conditions F-5. (Fig. 19, page 70; Fig. 20, page 71; Fig. 26)
W13

1- 51.4 inches
2- 49.6 inches
3- 48.1 inches
4- 46.9 inches

TAKEOFF EPR, SPEEDS AND STAB TRIM SETTING

MAX TAKEOFF EPR

ENG 1 & 3 AIRBLEED ON
ENG 2 NO AIRBLEED

PRESS ALT FT		OAT °F / °C	-67 TO -9 / -55 TO -23	-4 / -20	5 / -15	14 / -10	23 / -5	32 / 0	41 / 5	50 / 10	0 - 60 KNOTS 59 / 15	68 / 20	77 / 25	86 / 30	95 / 35	104 / 40	113 / 45	120 / 49
-1000	ENG	1 & 3	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.03	1.99	1.94	1.91
		2	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.05	2.00	1.96	1.92
S.L.		1 & 3	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.08	2.03	1.99	1.94	1.91
		2	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.10	2.05	2.00	1.96	1.92
1000		1 & 3	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.13	2.12	2.12	2.11	2.08	2.03	1.99	1.94	1.91
		2	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.15	2.13	2.13	2.12	2.10	2.05	2.00	1.96	1.92
2000		1 & 3	2.21	2.21	2.21	2.21	2.20	2.17	2.14	2.14	2.14	2.11	2.08	2.03	1.99	1.94	1.91	
		2	2.22	2.22	2.22	2.22	2.21	2.18	2.16	2.16	2.15	2.12	2.10	2.05	2.00	1.96	1.92	
3000		1 & 3	2.26	2.26	2.25	2.23	2.20	2.17	2.14	2.14	2.14	2.11	2.08	2.03	1.99	1.94	1.91	
		2	2.28	2.28	2.27	2.24	2.21	2.18	2.16	2.16	2.15	2.12	2.10	2.05	2.00	1.96	1.92	
3856 & ABOVE		1 & 3	2.31	2.29	2.27	2.25	2.23	2.20	2.17	2.14	2.14	2.14	2.11	2.08	2.03	1.99	1.94	1.91
		2	2.32	2.31	2.29	2.27	2.24	2.21	2.18	2.16	2.16	2.15	2.12	2.10	2.05	2.00	1.96	1.92

EPR BLEED CORRECTIONS	ENG 1 & 3	ENG 2
AIR CONDITIONING	OFF +.04	-
ENGINE ANTI-ICE ON	-	-.03

REDUCE ENG 2 EPR BY .05 WITH 8TH STAGE BLEED ON (IF INSTALLED) FOR 10°C (50°F) OAT & WARMER

V_1, V_R, V_2

ANTI-SKID OPERATIVE

PRESSURE ALT - 1000 FT		OAT (ABOVE CERTIFIED ALTITUDE)											
9 TO 11	°F	-65 TO 25						26 TO 87					
	°C	-54 TO -4						-3 TO 31					
7 TO 9	°F	-65 TO 9				10 TO 75				76 TO 104			
	°C	-54 TO -13				-12 TO 24				25 TO 40			
5 TO 7	°F	-65 TO -10		-8 TO 42				43 TO 97				98 TO 111	
	°C	-54 TO -23		-22 TO 5				6 TO 36				37 TO 44	
3 TO 5	°F	-65 TO 32		33 TO 90				91 TO 113				114 TO 120	
	°C	-54 TO 0		1 TO 32				33 TO 45				46 TO 49	
1 TO 3	°F	-65 TO 83		84 TO 106				107 TO 120					
	°C	-54 TO 28		29 TO 41				42 TO 49					
-1 TO 1	°F	-65 TO 99		100 TO 120									
	°C	-54 TO 37		38 TO 49									
FLAPS	GROSS WEIGHT 1000 LB	V_1=V_R	V_2	V_1=V_R	V_2	V_1=V_R	V_2	V_1=V_R	V_2	V_1=V_R	V_2	V_1=V_R	V_2
5	210	165	175	166	175								
	200	160	171	162	171								
	190	155	167	157	167	158	167						
	180	150	163	152	163	154	163						
	170	144	159	147	159	149	159	150	158				
	160	140	154	141	153	143	153	145	153				
	150	135	149	136	149	138	149	140	148				
	140	129	145	130	145	132	144	134	144				
	130	124	140	125	139	126	138	128	138				
	120	119	135	120	134	120	134	121	133				
15	210	156	166	157	166								
	200	151	162	153	162								
	190	146	158	148	158	149	158						
	180	141	154	143	154	145	154						
	170	136	150	138	150	140	150	141	149				
	160	132	146	133	145	135	145	137	145				
	150	127	141	128	141	130	141	132	140				
	140	122	137	123	137	124	136	126	136				
	130	117	133	118	132	118	131	120	131				
	120	112	128	113	127	113	127	115	126				
20	210	151	161	152	161								
	200	146	157	148	157								
	190	141	153	143	153	144	153						
	180	136	150	138	150	140	149						
	170	132	146	133	146	135	145	136	145				
	160	128	142	129	141	131	141	133	141				
	150	123	137	124	137	126	136	128	136				
	140	118	133	119	133	120	132	122	132				
	130	113	129	114	128	114	127	116	127				
	120	109	124	109	123	109	123	111	122				
25	210	146	157	147	157								
	200	141	153	143	153								
	190	137	149	138	149	139	149						
	180	132	145	134	145	136	145						
	170	127	141	129	141	131	141	132	140				
	160	123	137	124	137	126	137	128	136				
	150	119	133	120	133	122	133	124	132				
	140	114	129	115	129	116	128	118	128				
	130	109	125	110	124	110	124	112	123				
	120	105	120	106	120	106	119	108	118				

STAB TRIM SETTING

CG %	FLAPS 5	FLAPS 15 /20	FLAPS 25
	UNITS AIRPLANE NOSE UP		
10	6 3/4	7 1/2	8 1/4
12	6 1/2	7 1/4	8
14	6 1/4	7	7 3/4
16	6	6 3/4	7 1/2
18	5 3/4	6 1/2	7
20	5 1/2	6	6 1/2
22	5	5 3/4	6 1/4
24	4 3/4	5 1/4	5 3/4
26	4 1/2	4 3/4	5 1/4
28	4	4 1/2	4 3/4
30	3 3/4	4	4 1/4
32	3 1/2	3 3/4	4
34	3 1/4	3 1/4	3 1/2
36	2 3/4	3	3
38	2 1/2	2 1/2	2 1/2
40	2 1/2	2 1/2	2 1/2
42	2 1/2	2 1/2	2 1/2

FLAP RETRACTION/ MANEUVERING SPEEDS

GROSS WEIGHT LB	FLAP POSITION 15	5	2	0
154500 & BELOW	150	160	190	200
154501 TO 176000	160	170	200	210
176001 TO 191000	170	180	210	220
ABOVE 191000	180	190	225	235

FOR MANEUVERS IMMEDIATELY AFTER TAKEOFF EXCEEDING 15° BANK MAINTAIN AT LEAST V_2+10 AT TAKEOFF FLAPS

Figure 27

541. What should be the minimum maneuvering speed immediately after takeoff for a
Y13 15° banked turn for Operating Conditions G-1? (Fig. 27, page 77; Fig. 28)

1- 154 knots
2- 152 knots
3- 158 knots
4- 162 knots

542. What should be the takeoff safety speed for Operating Conditions G-1?
Y13 (Fig. 27, page 77; Fig. 28)

1- 148 knots
2- 150 knots
3- 152 knots
4- 154 knots

543. What should be the STAB TRIM setting for Operating Conditions G-1 if the
Y12 CG is located 41.6 inches aft of LEMAC? (Fig. 27, page 77; Fig. 28)

1- 5 1/4 units ANU
2- 5 1/2 units ANU
3- 5 3/4 units ANU
4- 6 units ANU

544. What should be the takeoff EPR for Operating Conditions G-1? (Fig. 27,
Y11 page 77; Fig. 28)

	Eng. 1 & 3	Eng. 2
1-	2.11	2.12
2-	2.11	2.07
3-	2.15	2.15
4-	2.15	2.17

545. What should be the minimum maneuvering speed immediately after takeoff
Y13 for a turn exceeding 15° of bank for Operating Conditions G-2? (Fig. 27, page 77; Fig. 28)

1- 144 knots
2- 146 knots
3- 156 knots
4- 158 knots

546. What should be the STAB TRIM setting for Operating Conditions G-2 if the
Y12 CG is located 899.9 inches aft of datum? (Fig. 27, page 77; Fig. 28)

1- 6 1/2 units ANU
2- 6 1/4 units ANU
3- 6 units ANU
4- 5 3/4 units ANU

547. What should be the takeoff safety speed for Operating Conditions G-2? (Fig. 27,
Y13 page 77; Fig. 28)

1- 134 knots
2- 136 knots
3- 146 knots
4- 148 knots

548. What should be the takeoff EPR for Operating Conditions G-2? (Fig. 27,
Y11 page 77; Fig. 28)

	Eng. 1 & 3	Eng. 2
1-	2.16	2.17
2-	2.22	2.16
3-	2.16	2.09
4-	2.20	2.09

549. What should be the minimum maneuvering speed immediately after takeoff for a
Y13 20° banked turn for Operating Conditions G-3? (Fig. 27, page 77; Fig. 28)

1- 145 knots
2- 147 knots
3- 149 knots
4- 151 knots

550. What should be the STAB TRIM setting for Operating Conditions G-3 if the CG is
Y12 located 39.9 inches aft of LEMAC? (Fig. 27, page 77; Fig. 28)

1- 6 1/4 units ANU
2- 6 units ANU
3- 5 3/4 units ANU
4- 5 units ANU

551. What should be the takeoff safety speed for Operating Conditions G-3? (Fig. 27,
Y13 page 77; Fig. 28)

1- 141 knots
2- 139 knots
3- 137 knots
4- 135 knots

552. What should be the takeoff EPR for Operating Conditions G-3? (Fig. 27,
Y11 page 77; Fig. 28)

	Eng. 1 & 3	Eng. 2
1-	2.12	2.07
2-	2.12	2.10
3-	2.08	2.05
4-	2.08	2.10

TAKEOFF EPR, SPEEDS, and STAB TRIM

OPERATING CONDITIONS	G-1	G-2	G-3	G-4	G-5
Field elevation	500	1,500	2,500	1,000	4,200
Altimeter setting	29.92	29.92	29.92	29.92	29.92
Outside air temp.	+68°F.	+5°F.	+86°F.	+63°F.	+10°F.
Air cond: Engs. 1 & 3	ON	OFF	ON	ON	OFF
Anti-ice: Eng. 2	OFF	ON	OFF	OFF	ON
Gross weight (1,000 lbs.)	175	175	165	175	180
6th stage bleed: Eng. 2	ON	ON	OFF	ON	ON
Flap position	15	20	25	15	20
LEMAC	860.5 in. aft of datum				
MAC	180.9 in.				

Figure 28

553. Y13 What should be the minimum maneuvering speed immediately after takeoff for a turn exceeding 15° of bank for Operating Conditions G-4? (Fig. 27, page 77; Fig. 28)

1- 154 knots
2- 152 knots
3- 164 knots
4- 162 knots

554. Y12 What should be the STAB TRIM setting for Operating Conditions G-4 if the CG is located 905.7 inches aft of datum? (Fig. 27, page 77; Fig. 28)

1- 5 1/4 units ANU
2- 5 units ANU
3- 4 3/4 units ANU
4- 4 1/2 units ANU

555. Y13 What should be the takeoff safety speed for Operating Conditions G-4? (Fig. 27, page 77; Fig. 28)

1- 150 knots
2- 152 knots
3- 154 knots
4- 155 knots

556. Y11 What should be the takeoff EPR for Operating Conditions G-4? (Fig. 27, page 77; Fig. 28)

	Eng. 1 & 3	Eng. 2
1-	2.12	2.13
2-	2.12	2.08
3-	2.04	2.06
4-	2.04	2.01

557. Y13 What should be the minimum maneuvering speed immediately after takeoff for a 15° banked turn for Operating Conditions G-5? (Fig. 27, page 77; Fig. 28)

1- 150 knots
2- 154 knots
3- 156 knots
4- 160 knots

558. Y12 What should be the STAB TRIM setting for Operating Conditions G-5 if the CG is located 43.5 inches aft of LEMAC? (Fig. 27, page 77; Fig. 28)

1- 5 1/2 units ANU
2- 4 1/2 units ANU
3- 5 1/4 units ANU
4- 4 3/4 units ANU

559. Y13 What should be the takeoff safety speed for Operating Conditions G-5? (Fig. 27, page 77; Fig. 28)

1- 136 knots
2- 150 knots
3- 141 knots
4- 154 knots

560. Y11 What should be the takeoff EPR for Operating Conditions G-5? (Fig. 27, page 77; Fig. 28)

	Eng. 1 & 3	Eng. 2
1-	2.14	2.13
2-	2.18	2.16
3-	2.26	2.30
4-	2.30	2.25

TAKEOFF EPR, SPEEDS AND STAB TRIM SETTING

MAX TAKEOFF EPR

0 - 60 KNOTS

PRESS ALT FT		OAT °F / °C	-67 TO -9 / -55 TO -23	-4 / -20	5 / -15	14 / -10	23 / -5	32 / 0	41 / 5	50 / 10	59 / 15	68 / 20	77 / 25	86 / 30	95 / 35	104 / 40	113 / 45	120 / 49
-1000	ENG	1 & 3	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.03	1.99	1.94	1.91
		2	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.05	2.00	1.96	1.92
S.L.		1 & 3	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.08	2.03	1.99	1.94	1.91
		2	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.10	2.05	2.00	1.96	1.92
1000		1 & 3	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.13	2.12	2.12	2.11	2.08	2.03	1.99	1.94	1.91
		2	2.16	2.16	2.16	2.16	2.16	2.16	2.15	2.13	2.13	2.12	2.10	2.05	2.00	1.96	1.92
2000		1 & 3	2.21	2.21	2.21	2.21	2.21	2.20	2.17	2.14	2.14	2.14	2.11	2.08	2.03	1.99	1.94	1.91
		2	2.22	2.22	2.22	2.22	2.22	2.21	2.18	2.16	2.16	2.15	2.12	2.10	2.05	2.00	1.96	1.92
3000		1 & 3	2.26	2.26	2.26	2.25	2.23	2.20	2.17	2.14	2.14	2.14	2.11	2.08	2.03	1.99	1.94	1.91
		2	2.28	2.28	2.28	2.27	2.24	2.21	2.18	2.16	2.16	2.15	2.12	2.10	2.05	2.00	1.96	1.92
3856 & ABOVE		1 & 3	2.31	2.29	2.27	2.25	2.23	2.20	2.17	2.14	2.14	2.14	2.11	2.08	2.03	1.99	1.94	1.91
		2	2.32	2.31	2.29	2.27	2.24	2.21	2.18	2.16	2.16	2.15	2.12	2.10	2.05	2.00	1.96	1.92

ENG 1 & 3 AIRBLEED ON
ENG 2 NO AIRBLEED

EPR BLEED CORRECTIONS	ENG 1 & 3	ENG 2
AIR CONDITIONING	OFF+.04	-
ENGINE ANTI-ICE ON	-	-.03

REDUCE ENG 2 EPR BY .05 WITH 6TH STAGE BLEED ON (IF INSTALLED) FOR 10°C (50°F) OAT & WARMER

V_1, V_R, V_2

ANTI-SKID OPERATIVE

PRESSURE ALT - 1000 FT		OAT (ABOVE CERTIFIED ALTITUDE)									
9 TO 11	°F / °C	-65 / -54	TO	25 / -4		26 / -3	TO	87 / 31			
7 TO 9	°F / °C	-65 / -54	TO	9 / -13		10 / -12	TO	75 / 24		76 / 25	TO	104 / 40
5 TO 7	°F / °C	-65 / -54	TO	-10 / -23		-8 / -22	TO	42 / 5		43 / 6	TO	97 / 36	98 / 37	TO	111 / 44
3 TO 5	°F / °C	-65 / -54	TO	32 / 0		33 / 1	TO	90 / 32		91 / 33	TO	113 / 45	114 / 46	TO	120 / 49
1 TO 3	°F / °C	-65 / -54	TO	83 / 28		84 / 29	TO	106 / 41		107 / 42	TO	120 / 49			
-1 TO 1	°F / °C	-65 / -54	TO	99 / 37		100 / 38	TO	120 / 49							

FLAPS	GROSS WEIGHT 1000 LB	V_1=V_R	V_2	V_1=V_R	V_2	V_1=V_R	V_2	V_1=V_R	V_2
5	210	165	175	166	175				
	200	160	171	162	171				
	190	155	167	157	167	158	167		
	180	150	163	152	163	154	163		
	170	144	159	147	159	149	159	150	158
	160	140	154	141	153	143	153	145	153
	150	135	149	136	149	138	149	140	148
	140	129	145	130	145	132	144	134	144
	130	124	140	125	139	126	138	128	138
	120	119	135	120	134	120	134	121	133
15	210	156	166	157	166				
	200	151	162	153	162				
	190	146	158	148	158	149	158		
	180	141	154	143	154	145	154		
	170	136	150	138	150	140	150	141	149
	160	132	146	133	145	135	145	137	145
	150	127	141	128	141	130	141	132	140
	140	122	137	123	137	124	136	126	136
	130	117	133	118	132	118	131	120	131
	120	112	128	113	127	113	127	115	126
20	210	151	161	152	161				
	200	146	157	148	157				
	190	141	153	143	153	144	153		
	180	136	150	138	150	140	149		
	170	132	146	133	146	135	145	136	145
	160	128	142	129	141	131	141	133	141
	150	123	137	124	137	126	136	128	136
	140	118	133	119	133	120	132	122	132
	130	113	129	114	128	114	127	116	127
	120	109	124	109	123	109	123	111	122
25	210	146	157	147	157				
	200	141	153	143	153				
	190	137	149	138	149	139	149		
	180	132	145	134	145	136	145		
	170	127	141	129	141	131	141	132	140
	160	123	137	124	137	126	137	128	136
	150	119	133	120	133	122	133	124	132
	140	114	129	115	129	116	128	118	128
	130	109	125	110	124	110	124	112	123
	120	105	120	106	120	106	119	108	118

STAB TRIM SETTING

CG	FLAPS 5	FLAPS 15 /20	FLAPS 25
	UNITS AIRPLANE NOSE UP		
10	6 3/4	7 1/2	8 1/4
12	6 1/2	7 1/4	8
14	6 1/4	7	7 3/4
16	6	6 3/4	7 1/2
18	5 3/4	6 1/2	7
20	5 1/2	6	6 1/2
22	5	5 3/4	6 1/4
24	4 3/4	5 1/4	5 3/4
26	4 1/2	4 3/4	5 1/4
28	4	4 1/2	4 3/4
30	3 3/4	4	4 1/4
32	3 1/2	3 3/4	4
34	3 1/4	3 1/4	3 1/2
36	2 3/4	3	3
38	2 1/2	2 1/2	2 1/2
40	2 1/2	2 1/2	2 1/2
42	2 1/2	2 1/2	2 1/2

FLAP RETRACTION/ MANEUVERING SPEEDS

GROSS WEIGHT LB	FLAP POSITION 15	5	2	0
154500 & BELOW	150	160	190	200
154501 TO 176000	160	170	200	210
176001 TO 191000	170	180	210	220
ABOVE 191000	180	190	225	235

FOR MANEUVERS IMMEDIATELY AFTER TAKEOFF EXCEEDING 15° BANK MAINTAIN AT LEAST V_2+10 AT TAKEOFF FLAPS

Figure 29

561. What should be the STAB TRIM setting for Operating Conditions H-1 if the
Y12 CG is located 41.6 inches aft of LEMAC? (Fig. 29; Fig. 30, page 82)

1- 5 units ANU
2- 5 1/4 units ANU
3- 5 1/2 units ANU
4- 5 3/4 units ANU

562. What should be the takeoff safety speed for Operating Conditions H-1? (Fig. 29;
Y13 Fig. 30, page 82)

1- 154 knots
2- 156 knots
3- 158 knots
4- 143 knots

563. What should be the takeoff EPR for Operating Conditions H-1? (Fig. 29;
Y11 Fig. 30, page 82)

	Eng. 1 & 3	Eng. 2
1-	2.14	2.06
2-	2.14	2.11
3-	2.10	2.11
4-	2.06	2.16

564. What should be the minimum maneuvering speed immediately after takeoff
Y13 for a 15° banked turn for Operating Conditions H-2? (Fig. 29; Fig. 30, page 82)

1- 158 knots
2- 156 knots
3- 148 knots
4- 146 knots

565. What should be the takeoff safety speed for Operating Conditions H-2?
Y13 (Fig. 29; Fig. 30, page 82)

1- 150 knots
2- 148 knots
3- 146 knots
4- 135 knots

566. What should be the STAB TRIM setting for Operating Conditions H-2 if the
Y12 CG is located 913.0 inches aft of datum? (Fig. 29; Fig. 30, page 82)

1- 4 units ANU
2- 4 1/4 units ANU
3- 4 1/2 units ANU
4- 4 3/4 units ANU

567. What should be the average takeoff EPR for Operating Conditions H-2? (Fig. 29;
Y11 Fig. 30, page 82)

	Eng. 1 & 3	Eng. 2
1-	2.12	2.05
2-	2.08	2.10
3-	2.12	2.10
4-	2.08	2.05

568. What should be the minimum maneuvering speed immediately after takeoff for a
Y13 20° banked turn for Operating Conditions H-3? (Fig. 29; Fig. 30, page 82)

1- 161 knots
2- 159 knots
3- 157 knots
4- 151 knots

569. What should be the STAB TRIM setting for Operating Conditions H-3 if the
Y12 CG is located 41.6 inches aft of LEMAC? (Fig. 29; Fig. 30, page 82)

1- 5 3/4 units ANU
2- 6 units ANU
3- 6 1/4 units ANU
4- 6 1/2 units ANU

570. What should be the takeoff safety speed for Operating Conditions H-3?
Y13 (Fig. 29; Fig. 30, page 82)

1- 147 knots
2- 149 knots
3- 151 knots
4- 153 knots

571. What should be the average takeoff EPR for Operating Conditions H-3? (Fig. 29;
Y11 Fig. 30, page 82)

	Eng. 1 & 3	Eng. 2
1-	2.11	2.14
2-	2.18	2.21
3-	2.14	2.11
4-	2.18	2.16

572. What should be the minimum maneuvering speed immediately after takeoff for a
Y13 15° banked turn for Operating Conditions H-1? (Fig. 29; Fig. 30, page 82)

1- 144 knots
2- 146 knots
3- 148 knots
4- 158 knots

TAKEOFF EPR, SPEEDS, and STAB TRIM

OPERATING CONDITIONS	H-1	H-2	H-3	H-4	H-5
Field elevation	S.L.	4,100	3,000	2,500	1,500
Altimeter setting	29.92	29.92	29.92	29.92	29.92
Outside air temp.	+73°F.	+85°F.	+55°F.	+23°F.	+14°F.
Air cond: Engs. 1 & 3	OFF	ON	ON	OFF	OFF
Anti-ice: Eng. 2	OFF	OFF	OFF	ON	ON
Gross weight (1,000 lbs.)	185	175	195	175	165
6th stage bleed: Eng. 2	ON	ON	ON	ON	OFF
Flap position	15	20	25	20	15
LEMAC	860.5 in. aft of datum				
MAC	180.9 in.				

Figure 30

573. Y12 What should be the STAB TRIM setting for Operating Conditions H-4 if the CG is located 901.0 inches aft of datum? (Fig. 29, page 80; Fig. 30)

1- 5 1/4 units ANU
2- 5 1/2 units ANU
3- 5 3/4 units ANU
4- 6 units ANU

574. Y13 What should be the takeoff safety speed for Operating Conditions H-4? (Fig. 29, page 80; Fig. 30)

1- 134 knots
2- 136 knots
3- 146 knots
4- 148 knots

575. Y11 What should be the average takeoff EPR for Operating Conditions H-4? (Fig. 29, page 80; Fig. 30)

	Eng. 1 & 3	Eng. 2
1-	2.26	2.20
2-	2.22	2.23
3-	2.18	2.20
4-	2.22	2.23

576. Y13 What should be the minimum maneuvering speed immediately after takeoff for a 20° banked turn for Operating Conditions H-5? (Fig. 29, page 80; Fig. 30)

1- 166 knots
2- 164 knots
3- 158 knots
4- 156 knots

577. Y13 What should be the minimum maneuvering speed immediately after takeoff for a 20° banked turn for Operating Conditions H-5? (Fig. 29, page 80; Fig. 30)

1- 144 knots
2- 146 knots
3- 156 knots
4- 158 knots

578. Y12 What should be the STAB TRIM setting for Operating Conditions H-5 if the CG is located 41.5 inches aft of LEMAC? (Fig. 29, page 80; Fig. 30)

1- 5 1/4 units ANU
2- 5 1/2 units ANU
3- 5 3/4 units ANU
4- 6 units ANU

579. Y13 What should be the takeoff safety speed for Operating Conditions H-5? (Fig. 29, page 80; Fig. 30)

1- 134 knots
2- 136 knots
3- 146 knots
4- 148 knots

580. Y11 What should be the average takeoff EPR for Operating Conditions H-5? (Fig. 29, page 80; Fig. 30)

	Eng. 1 & 3	Eng. 2
1-	2.18	2.19
2-	2.22	2.16
3-	2.18	2.14
4-	2.14	2.19

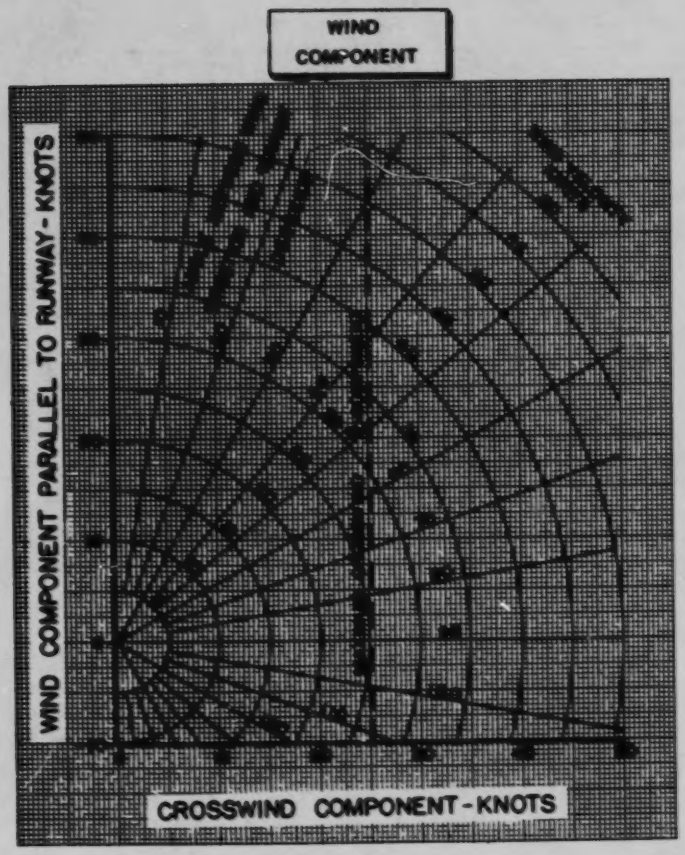


Figure 31

581. The ATIS reported wind is 180° at 25 knots. What is the crosswind
Y10 component for a RWY 13 landing? (Fig. 27)

1- 19 knots
2- 21 knots
3- 22 knots
4- 25 knots

582. If the tower-reported wind is 010° at 18 knots, what is the crosswind
Y10 component for a RWY 8 departure? (Fig. 27)

1- 25 knots
2- 23 knots
3- 19 knots
4- 17 knots

583. What is the crosswind component for a RWY 13 takeoff if the surface wind
Y10 is 190° at 15 knots? (Fig. 27)

1- 13 knots
2- 15 knots
3- 18 knots
4- 20 knots

584. Which wind would exceed a crosswind limitation of 25 knots for a RWY 1
Y10 takeoff? (Fig. 27)

1- 30 knots; 070°
2- 25 knots; 110°
3- 26 knots; 080°
4- 37 knots; 050°

585. If the tower-reported surface wind is 020° at 18 knots, what is the
Y10 crosswind component for a RWY 13 landing? (Fig. 27)

1- 13 knots
2- 17 knots
3- 21 knots
4- 24 knots

586. The ATIS-reported wind is 250° at 22 knots. What is the crosswind
Y10 component for a RWY 17 departure? (Fig. 27)

1- 26 knots
2- 24 knots
3- 22 knots
4- 19 knots

TAKEOFF PERFORMANCE (Runway Limit)

OPERATING CONDITIONS	I-1	I-2	I-3	I-4	I-5
Pressure altitude	S.L.	1,000	1,500	3,000	4,000
Outside air temp.	+85°F.	+68°F.	+15°F.	+13°F.	+9°F.
Runway length	8,000	8,500	9,000	9,500	10,000
Runway slope	-1%	+1%	0%	-2%	0%
Headwind comp. (kts.)	--	--	CALM	20	10
Tailwind comp. (kts.)	10	10	--	--	--
Flap position	15	20	25	15	15
Air cond. bleed air	ON	ON	OFF	OFF	OFF
AUTOPACK TRIP inop.	YES	NO	YES	NO	YES
ENG FAIL WARN LT inop.	NO	YES	NO	YES	YES
6th stage bleed air	OFF	ON	OFF	ON	OFF
Engine anti-ice	OFF	OFF	ON	ON	OFF

Figure 32

587. Determine the field length limit gross weight for Operating Conditions I-1.
Y14 (Fig. 32 and Fig. 33)

1- 163,100 pounds
2- 165,000 pounds
3- 170,200 pounds
4- 176,000 pounds

588. Determine the field length limit gross weight for Operating Condi-
Y14 tions I-2. (Fig. 32 and Fig. 33)

1- 163,600 pounds
2- 165,200 pounds
3- 170,200 pounds
4- 173,500 pounds

589. Determine the field length limit gross weight for Operating Condi-
Y14 tions I-3. (Fig. 32 and Fig. 33)

1- 200,500 pounds
2- 204,300 pounds
3- 208,200 pounds
4- 210,500 pounds

590. Determine the field length limit gross weight for Operating Conditions I-4.
Y14 (Fig. 32 and Fig. 33)

1- 204,500 pounds
2- 207,600 pounds
3- 212,600 pounds
4- 215,000 pounds

591. Determine the field length limit gross weight for Operating Conditions I-5.
Y14 (Fig. 32 and Fig. 33)

1- 205,300 pounds
2- 200,300 pounds
3- 195,500 pounds
4- 193,000 pounds

TAKEOFF PERFORMANCE

AVERAGE TAKEOFF EPR A/C BLEED ON										
PRESS ALT FT	°F	-67 TO -9	-4	14	32	50	68	86	104	122
	°C	-55 TO -23	-20	-10	0	10	20	30	40	50
-1000		2.05	2.05	2.05	2.05	2.05	2.05	2.05	1.99	1.90
S.L.		2.10	2.10	2.10	2.10	2.10	2.10	2.09	1.99	1.90
1000		2.15	2.15	2.15	2.15	2.14	2.12	2.09	1.99	1.90
2000		2.21	2.21	2.21	2.20	2.15	2.14	2.09	1.99	1.90
3000		2.27	2.27	2.26	2.20	2.15	2.14	2.09	1.99	1.90
3856 & ABOVE		2.31	2.30	2.26	2.20	2.15	2.14	2.09	1.99	1.90

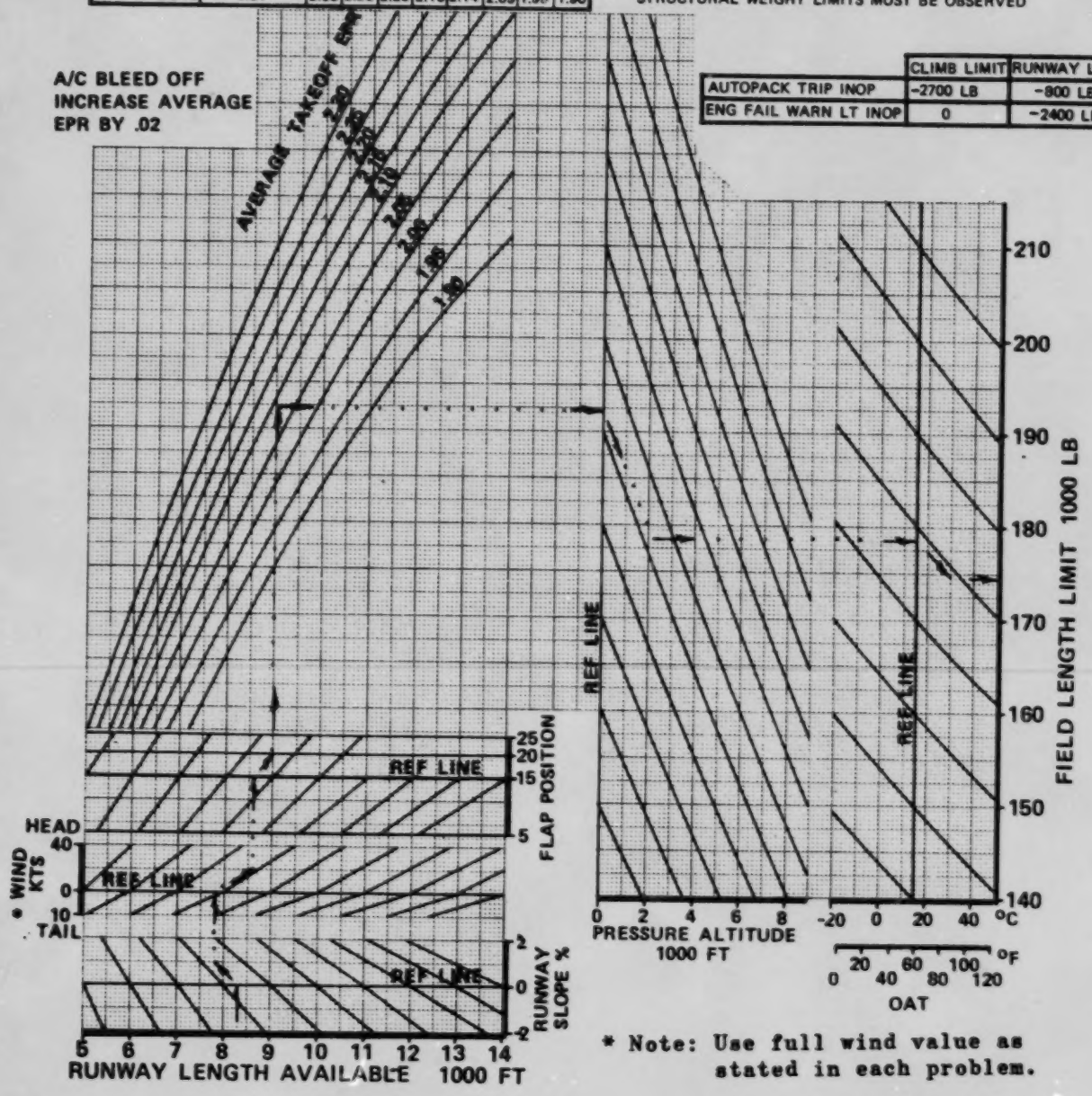
BASED ON
1 ANTI-SKID OPERATIVE (ANTI-SKID INOP SEE TEXT)
2 A/C BLEED ON
3 AUTOPACK TRIP OPERATIVE
4 ENGINE FAILURE WARNING LIGHT OPERATIVE

NOTE: DETERMINE AVERAGE TAKEOFF EPR FROM TABLE. WITH 6th STAGE BLEED ON AT 10°C (50°F) AND WARMER, REDUCE CLIMB LIMIT WEIGHT BY 4400 LB (2000 KG) & FIELD LIMIT WT BY 1800 LB (800 KG). FOR ENGINE A/I ON REDUCE AVERAGE EPR BY .01.

STRUCTURAL WEIGHT LIMITS MUST BE OBSERVED

	CLIMB LIMIT	RUNWAY LIMIT
AUTOPACK TRIP INOP	-2700 LB	-800 LB
ENG FAIL WARN LT INOP	0	-2400 LB

A/C BLEED OFF
INCREASE AVERAGE
EPR BY .02



* Note: Use full wind value as stated in each problem.

Figure 33

TAKEOFF PERFORMANCE (Runway Limit)

OPERATING CONDITIONS	J-1	J-2	J-3	J-4	J-5
Pressure altitude	S.L.	1,000	1,000	2,500	3,000
Outside air temp.	+40°F.	+32°F.	+24°F.	+50°F.	+95°F.
Runway length	9,500	7,000	8,500	9,000	8,000
Runway slope	0%	0%	+2%	-2%	0%
Headwind comp. (kts.)	--	--	30	10	20
Tailwind comp. (kts.)	5	10	--	--	--
Flap position	25	20	15	5	20
Air cond. bleed air	OFF	ON	ON	OFF	ON
AUTOPACK TRIP inop.	NO	YES	NO	YES	NO
ENG FAIL WARN LT inop.	YES	NO	YES	NO	YES
6th stage bleed air	OFF	OFF	ON	OFF	ON
Engine anti-ice	ON	OFF	OFF	OFF	OFF

Figure 34

592. Determine the field length limit gross weight for Operating Conditions J-1. (Fig. 33, page 85; Fig. 34)
Y14

1- 197,500 pounds
2- 202,600 pounds
3- 207,000 pounds
4- 209,200 pounds

593. Determine the field length limit gross weight for Operating Conditions J-2. (Fig. 33, page 85; Fig. 34)
Y14

1- 171,500 pounds
2- 167,800 pounds
3- 163,200 pounds
4- 158,500 pounds

594. Determine the field length limit gross weight for Operating Conditions J-3. (Fig. 33, page 85; Fig. 34)
Y14

1- 195,500 pounds
2- 191,000 pounds
3- 186,500 pounds
4- 184,000 pounds

595. Determine the field length limit gross weight for Operating Conditions J-4. (Fig. 33, page 85; Fig. 34)
Y14

1- 184,200 pounds
2- 180,000 pounds
3- 177,000 pounds
4- 175,500 pounds

596. Determine the field length limit gross weight for Operating Conditions J-5. (Fig. 33, page 85; Fig. 34)
Y14

1- 159,500 pounds
2- 164,200 pounds
3- 168,500 pounds
4- 170,800 pounds

TAKEOFF PERFORMANCE

AVERAGE TAKEOFF EPR A/C BLEED ON										
PRESS ALT FT	°F	67 TO 9	-4	14	32	50	68	86	104	122
	°C	55 TO 23	-20	-10	0	10	20	30	40	50
1000		2.05	2.05	2.05	2.05	2.05	2.05	2.05	1.99	1.90
S.L.		2.10	2.10	2.10	2.10	2.10	2.10	2.09	1.99	1.90
1000		2.15	2.15	2.15	2.15	2.14	2.12	2.09	1.99	1.90
2000		2.21	2.21	2.21	2.20	2.15	2.14	2.09	1.99	1.90
3000		2.27	2.27	2.26	2.20	2.15	2.14	2.09	1.99	1.90
3868 & ABOVE		2.31	2.30	2.26	2.20	2.15	2.14	2.09	1.99	1.90

BASED ON
1. ANTI-SKID OPERATIVE (ANTI-SKID INOP SEE TEXT)
2. A/C BLEED ON
3. AUTOPACK TRIP OPERATIVE
4. ENGINE FAILURE WARNING LIGHT OPERATIVE

NOTE: DETERMINE AVERAGE TAKEOFF EPR FROM TABLE. WITH 8th STAGE BLEED ON AT 10°C (50°F) AND WARMER, REDUCE CLIMB LIMIT WEIGHT BY 4400 LB (2000 KG) & FIELD LIMIT WT BY 1800 LB (800 KG). FOR ENGINE A/I ON REDUCE AVERAGE EPR BY .01.
STRUCTURAL WEIGHT LIMITS MUST BE OBSERVED

	CLIMB LIMIT	RUNWAY LIMIT
AUTOPACK TRIP INOP	-2700 LB	-900 LB
ENG FAIL WARN LT INOP	0	-2400 LB

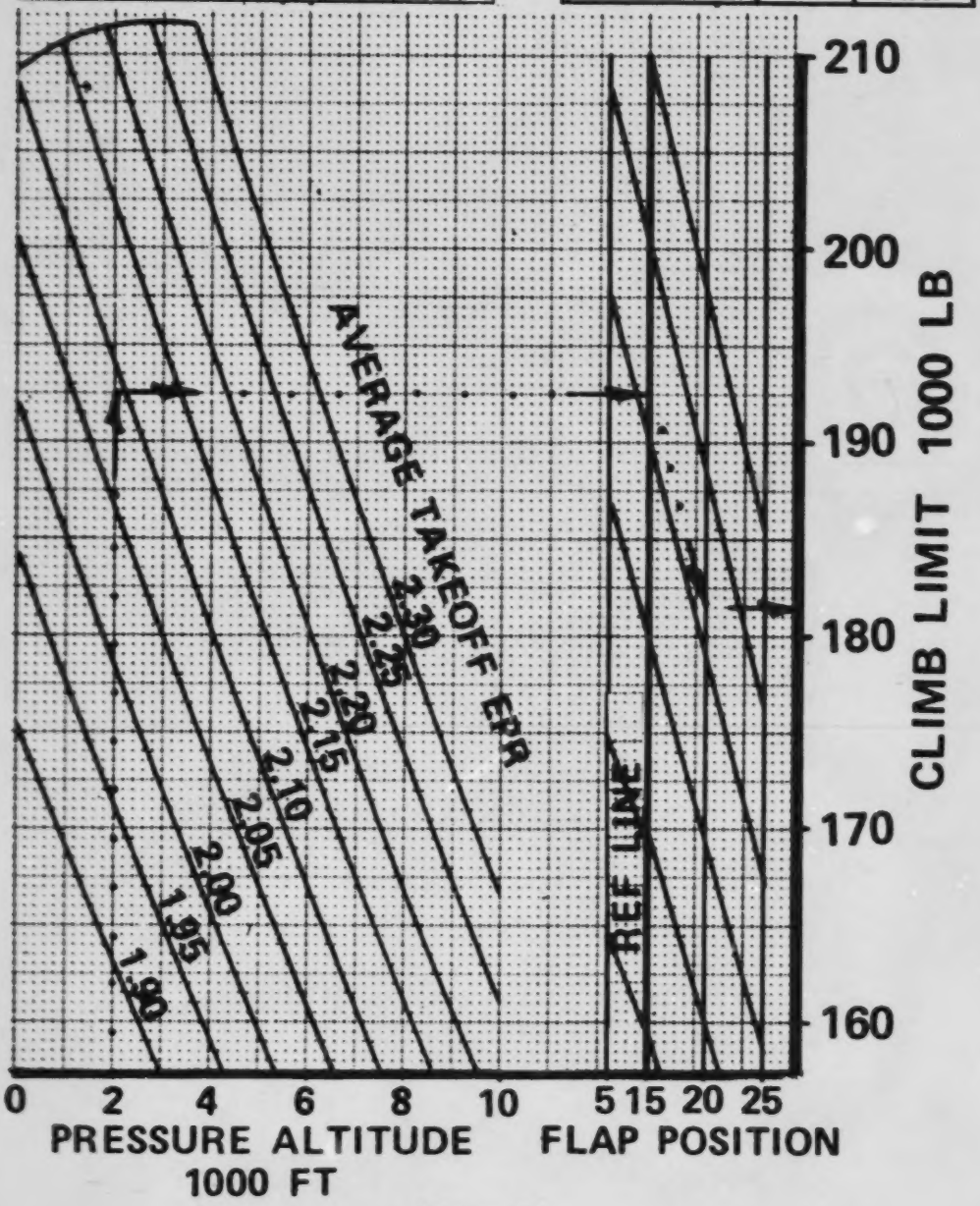


Figure 35

TAKEOFF PERFORMANCE (Climb Limit)

OPERATING CONDITIONS	K-1	K-2	K-3	K-4	K-5
Pressure altitude	3,900	1,000	3,000	2,500	1,000
Outside air temp.	+95°F.	+59°F.	+85°F.	+32°F.	+23°F.
AUTOPACK TRIP inop.	YES	NO	YES	NO	YES
ENG FAIL WARN LT inop.	NO	YES	NO	NO	YES
6th stage bleed air	ON	ON	ON	ON	OFF
Engine anti-ice	OFF	ON	OFF	OFF	ON
Flap position	15	20	25	20	15

Figure 36

597. Determine the climb limit gross weight using the necessary information in Operating Conditions K-1. (Fig. 35, page 87; Fig. 36)
Y14

1- 164,900 pounds
2- 169,800 pounds
3- 173,900 pounds
4- 175,800 pounds

598. Determine the climb limit gross weight using the necessary information in Operating Conditions K-2. (Fig. 35, page 87; Fig. 36)
Y14

1- 197,100 pounds
2- 195,300 pounds
3- 192,700 pounds
4- 187,600 pounds

599. Determine the climb limit gross weight using the necessary information in Operating Conditions K-3. (Fig. 35, page 87; Fig. 36)
Y14

1- 157,900 pounds
2- 161,800 pounds
3- 163,700 pounds
4- 161,500 pounds

600. Determine the climb limit gross weight using the necessary information in Operating Conditions K-4. (Fig. 35, page 87; Fig. 36)
Y14

1- 202,500 pounds
2- 201,700 pounds
3- 198,500 pounds
4- 194,000 pounds

601. Determine the climb limit gross weight using the necessary information in Operating Conditions K-5. (Fig. 35, page 87; Fig. 36)
Y14

1- 198,800 pounds
2- 204,800 pounds
3- 208,800 pounds
4- 210,000 pounds

TAKEOFF PERFORMANCE (Climb Limit)

OPERATING CONDITIONS	L-1	L-2	L-3	L-4	L-5
Pressure altitude	2,700	S.L.	4,300	3,900	4,100
Outside air temp.	+49°F.	+67°F.	+14°F.	+87°F.	+23°F.
AUTOPACK TRIP inop.	NO	YES	NO	NO	YES
ENG FAIL WARN LT inop.	YES	NO	YES	YES	YES
8th stage bleed air	ON	ON	OFF	ON	ON
Engine anti-ice	ON	OFF	ON	OFF	ON
Flap position	15	20	5	20	25

Figure 37

602. Determine the climb limit gross weight using the necessary information in Operating Conditions L-1. (Fig. 35, page 87; Fig. 37)
Y14

1- 204,800 pounds
2- 201,500 pounds
3- 199,000 pounds
4- 195,000 pounds

603. Determine the climb limit gross weight using the necessary information in Operating Conditions L-2. (Fig. 35, page 87; Fig. 37)
Y14

1- 199,500 pounds
2- 197,800 pounds
3- 193,000 pounds
4- 188,900 pounds

604. Determine the climb limit gross weight using the necessary information in Operating Conditions L-3. (Fig. 35, page 87; Fig. 37)
Y14

1- 208,500 pounds
2- 203,500 pounds
3- 198,800 pounds
4- 195,500 pounds

605. Determine the climb limit gross weight using the necessary information in Operating Conditions L-4. (Fig. 35, page 87; Fig. 37)
Y14

1- 159,500 pounds
2- 164,600 pounds
3- 170,000 pounds
4- 173,500 pounds

606. Determine the climb limit gross weight using the necessary information in Operating Conditions L-5. (Fig. 35, page 87; Fig. 37)
Y14

1- 175,500 pounds
2- 170,300 pounds
3- 165,000 pounds
4- 163,000 pounds

MAX CLIMB EPR

OPERATING CONDITIONS		M-1	M-2	M-3	M-4	M-5
Flight Level		250	300	200	300	350
Indicated Mach		.78	.80	.84	.80	.74
Air cond. air bleed:						
Engs. 1 & 3		OFF	OFF	ON	ON	OFF
Eng. 2		OFF	ON	OFF	ON	ON
Engine anti-ice:						
Engs. 1 & 3		ON	OFF	OFF	ON	ON
Eng. 2		ON	OFF	OFF	ON	ON
Engine/Wing anti-ice:						
Engs. 1 & 3	(Two eng. bleed)	OFF	ON	OFF	OFF	OFF
	(One eng. bleed)	OFF	OFF	ON	OFF	OFF
Eng. 2	(Two eng. bleed)	OFF	ON	OFF	OFF	OFF
	(One eng. bleed)	OFF	OFF	ON	OFF	OFF

Figure 38

607. What should be the MAX CLIMB EPR for Operating Conditions M-1?
Y25 (Fig. 38 and Fig. 39)

	Engines 1 & 3	Engine 2
1-	2.09	2.04
2-	2.09	2.24
3-	2.16	2.16
4-	2.10	2.16

608. What should be the MAX CLIMB EPR for Operating Conditions M-2?
Y25 (Fig. 38 and Fig. 39)

	Engines 1 & 3	Engine 2
1-	2.09	2.31
2-	2.25	2.15
3-	2.08	2.03
4-	2.17	2.15

609. What should be the MAX CLIMB EPR for Operating Conditions M-3?
Y25 (Fig. 38 and Fig. 39)

	Engines 1 & 3	Engine 2
1-	1.88	1.77
2-	2.01	2.12
3-	1.94	2.00
4-	1.77	1.88

610. What should be the MAX CLIMB EPR for Operating Conditions M-4?
Y25 (Fig. 38 and Fig. 39)

	Engines 1 & 3	Engine 2
1-	2.03	2.09
2-	2.09	2.03
3-	2.15	2.17
4-	2.17	2.23

611. What should be the MAX CLIMB EPR for Operating Conditions M-5?
Y25 (Fig. 38 and Fig. 39)

	Engines 1 & 3	Engine 2
1-	2.23	2.08
2-	2.21	2.20
3-	2.03	2.29
4-	2.23	2.09

MAX CLIMB EPR

MAX CLIMB EPR

ENG 1 & 3 A/C BLEED
ENG 2 NO BLEED

PRESS ALT FT	ENG	TAT °C																		
		-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45	50
S.L.	1 & 3	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.03	1.97	1.93	1.88	1.84	1.79	1.75	1.72	1.68	1.64
	2	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.05	2.00	1.95	1.90	1.86	1.82	1.78	1.74	1.70	1.67
1000	1 & 3	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.08	2.03	1.97	1.93	1.88	1.84	1.79	1.75	1.72	1.68	1.64
	2	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.11	2.05	2.00	1.95	1.90	1.86	1.82	1.78	1.74	1.70	1.67
2000	1 & 3	2.19	2.19	2.19	2.19	2.19	2.19	2.18	2.13	2.08	2.03	1.97	1.93	1.88	1.84	1.79	1.75	1.72	1.68	1.64
	2	2.21	2.21	2.21	2.21	2.21	2.21	2.20	2.16	2.11	2.05	2.00	1.95	1.90	1.86	1.82	1.78	1.74	1.70	1.67
3000	1 & 3	2.24	2.24	2.24	2.24	2.23	2.21	2.17	2.13	2.08	2.02	1.97	1.92	1.88	1.83	1.79	1.75	1.71	1.67	1.63
	2	2.26	2.26	2.26	2.26	2.26	2.23	2.20	2.16	2.11	2.05	2.00	1.95	1.90	1.86	1.82	1.78	1.74	1.70	1.67
3900 TO 5000	1 & 3	2.29	2.28	2.27	2.25	2.23	2.20	2.17	2.13	2.08	2.02	1.97	1.92	1.87	1.83	1.79	1.75	1.71	1.67	1.63
	2	2.32	2.31	2.29	2.28	2.26	2.23	2.20	2.16	2.11	2.05	2.00	1.95	1.90	1.86	1.82	1.78	1.74	1.70	1.67
10000	1 & 3	2.28	2.27	2.26	2.24	2.22	2.20	2.16	2.12	2.07	2.01	1.96	1.91	1.86	1.82	1.78	1.74	1.70	1.66	1.62
	2	2.32	2.31	2.29	2.28	2.26	2.23	2.20	2.16	2.11	2.05	2.00	1.95	1.90	1.86	1.82	1.78	1.74	1.70	1.67
20000	1 & 3	2.27	2.26	2.24	2.23	2.21	2.18	2.15	2.10	2.05	2.00	1.94	1.90	1.85	1.81	1.76	1.72	1.69	1.65	1.61
	2	2.32	2.31	2.29	2.28	2.26	2.23	2.20	2.16	2.11	2.05	2.00	1.95	1.90	1.86	1.82	1.78	1.74	1.70	1.67
30000	1 & 3	2.25	2.24	2.23	2.21	2.19	2.17	2.13	2.09	2.04	1.98	1.93	1.88	1.83	1.79	1.75	1.71	1.67	1.63	1.59
	2	2.32	2.31	2.29	2.28	2.26	2.23	2.20	2.16	2.11	2.05	2.00	1.95	1.90	1.86	1.82	1.78	1.74	1.70	1.67
40000 & ABOVE	1 & 3	2.23	2.22	2.20	2.19	2.17	2.14	2.11	2.06	2.01	1.96	1.90	1.86	1.81	1.77	1.72	1.68	1.65	1.61	1.57
	2	2.32	2.31	2.29	2.28	2.26	2.23	2.20	2.16	2.11	2.05	2.00	1.95	1.90	1.86	1.82	1.78	1.74	1.70	1.67

EPR BLEED CORRECTIONS		ENG 1 & 3	ENG 2
AIR CONDITIONING	S.L.	OFF + .04	ON - .04
	10000 FT	OFF + .05	ON - .05
AIR BLEED	20000 FT	OFF + .07	ON - .07
	30000 FT	OFF + .08	ON - .08
	40000 FT	OFF + .11	ON - .10
ENGINE ANTI-ICE ON		- .08	- .12
ENG AND WING ANTI-ICE	TWO ENG BLEEDS	- .17	- .12
	ONE ENG BLEED	- .17	

TOTAL TEMPERATURE AT ISA

PRESSURE ALTITUDE 1000 FT	INDICATED MACH NUMBER													
	0	.40	.50	.60	.70	.74	.78	.80	.82	.84	.86	.88	.90	.92
	TOTAL TEMPERATURE AT ISA DEGREES C													
36 TO 45	-56			-41	-35	-33	-30	-29	-27	-26	-24	-23	-21	-20
35	-54			-39	-33	-30	-28	-26	-25	-23	-22	-20	-19	-17
34	-52		-41	-36	-31	-28	-25	-24	-23	-21	-20	-18	-17	-15
33	-50		-39	-34	-29	-26	-23	-22	-20	-19	-17	-16	-14	-13
32	-48		-37	-32	-26	-24	-21	-20	-18	-17	-15	-14	-12	-10
31	-46		-35	-30	-24	-22	-19	-17	-16	-14	-13	-11	-10	-8
30	-44		-33	-28	-22	-19	-17	-15	-14	-12	-11	-9	-7	-6
29	-42		-31	-26	-20	-17	-14	-13	-11	-10	-8	-7	-5	-3
28	-40		-29	-24	-18	-15	-12	-11	-9	-8	-6	-4	-3	-1
27	-38		-27	-22	-15	-13	-10	-8	-7	-5	-4	-2	0	1
26	-37		-25	-19	-13	-11	-8	-6	-5	-3	-2	0	2	4
25	-35		-23	-17	-11	-8	-5	-4	-2	-1	1	2	4	6
24	-33	-25	-21	-15	-9	-6	-3	-2	0	1	3	5	6	8
23	-31	-23	-18	-13	-7	-4	-1	0	2	4	5	7	9	11
22	-29	-21	-16	-11	-5	-2	1	3	4	6	8	9	11	13
21	-27	-19	-14	-9	-2	0	3	5	7	8	11	12	13	
20	-25	-17	-12	-7	0	3	6	7	9	10	12	14		
19	-23	-15	-10	-5	2	5	8	9	11	13	14			

Figure 39

MAX CLIMB EPR

OPERATING CONDITIONS		N-1	N-2	N-3	N-4	N-5
Flight Level		200	400	190	400	300
Indicated Mach		.84	.70	.74	.78	.74
Air cond. air bleed:						
Engs. 1 & 3		OFF	OFF	ON	OFF	ON
Eng. 2		ON	ON	ON	ON	OFF
Engine anti-ice:						
Engs. 1 & 3		ON	OFF	ON	OFF	OFF
Eng. 2		ON	OFF	OFF	OFF	ON
Engine/Wing anti-ice:						
Engs. 1 & 3	(Two eng. bleed)	OFF	ON	OFF	OFF	ON
	(One eng. bleed)	OFF	OFF	OFF	ON	OFF
Eng. 2	(Two eng. bleed)	OFF	ON	OFF	OFF	OFF
	(One eng. bleed)	OFF	OFF	OFF	ON	OFF

Figure 40

612. What should be the MAX CLIMB EPR for Operating Conditions M-5?
Y25 (Fig. 39, page 91; Fig. 40)

	Eng. 1 & 3	Eng. 2
1-	2.09	2.05
2-	1.93	1.81
3-	2.01	2.07
4-	1.94	2.00

613. What should be the MAX CLIMB EPR for Operating Conditions M-4?
Y25 (Fig. 39, page 91; Fig. 40)

	Eng. 1 & 3	Eng. 2
1-	2.33	2.21
2-	2.11	2.41
3-	2.16	2.09
4-	2.22	2.31

614. What should be the MAX CLIMB EPR for Operating Conditions M-3?
Y25 (Fig. 39, page 91; Fig. 40)

	Eng. 1 & 3	Eng. 2
1-	2.13	2.11
2-	1.97	2.04
3-	1.92	1.98
4-	2.05	2.11

615. What should be the MAX CLIMB EPR for Operating Conditions M-2?
Y25 (Fig. 39, page 91; Fig. 40)

	Eng. 1 & 3	Eng. 2
1-	2.31	2.07
2-	2.31	2.19
3-	2.20	2.29
4-	2.14	2.07

616. What should be the MAX CLIMB EPR for Operating Conditions M-1?
Y25 (Fig. 39, page 91; Fig. 40)

	Eng. 1 & 3	Eng. 2
1-	2.02	2.14
2-	2.19	2.14
3-	2.26	2.14
4-	2.19	2.26

EPR
IAS - KTS
FF PER ENG - LB/HR

HOLDING **B-727**

PRESSURE ALTITUDE FT	GROSS WEIGHT - 1000 LB								
	200	190	180	170	160	150	140	130	120
25000	1.85 268 3600	1.81 261 3400	1.77 253 3210	1.73 246 3030	1.69 238 2860	1.64 230 2680	1.60 222 2510	1.55 213 2340	1.51 205 2180
20000	1.69 265 3630	1.66 258 3450	1.62 251 3280	1.59 244 3110	1.55 236 2940	1.51 228 2770	1.48 220 2600	1.44 212 2440	1.40 204 2270
15000	1.56 263 3670	1.53 256 3500	1.50 249 3340	1.47 242 3170	1.44 235 3000	1.41 227 2850	1.38 219 2680	1.35 211 2520	1.32 203 2350
10000	1.45 262 3800	1.43 255 3640	1.40 248 3480	1.38 241 3310	1.35 234 3140	1.33 226 2970	1.30 218 2810	1.28 210 2640	1.25 202 2480
5000	1.36 260 3890	1.34 254 3720	1.32 247 3550	1.30 240 3380	1.28 233 3220	1.26 225 3060	1.24 218 2890	1.22 210 2730	1.20 201 2560

Figure 41

617. What should be the EPR, airspeed, and total fuel required to hold
Y30 for 20 minutes at 20,000 feet pressure altitude at a gross weight of 165,000 pounds? (Fig. 41)

1- 1.55 EPR; 240 knots; 2,940 pounds
2- 1.57 EPR; 240 knots; 3,025 pounds
3- 1.57 EPR; 240 knots; 9,075 pounds
4- 1.59 EPR; 244 knots; 3,110 pounds

618. What should be the total amount of fuel required to hold for 20
Y30 minutes at 8,000 feet pressure altitude at a gross weight of 155,000 pounds? (Fig. 41)

1- 3,653 pounds
2- 3,122 pounds
3- 2,980 pounds
4- 2,795 pounds

619. What should be the approximate EPR, airspeed, and total fuel
Y30 required to hold at 8,000 feet pressure altitude for 20 minutes at a gross weight of 140,000 pounds? (Fig. 41)

1- 1.30 EPR; 216 knots; 8,574 pounds
2- 1.28 EPR; 216 knots; 8,574 pounds
3- 1.28 EPR; 218 knots; 2,858 pounds
4- 1.26 EPR; 218 knots; 2,858 pounds

620. What should be the IAS and total fuel required to hold at 20,000 feet pressure
Y30 altitude for 15 minutes at a gross weight of 135,000 pounds? (Fig. 41)

1- 216 knots; 1,890 pounds
2- 216 knots; 7,560 pounds
3- 214 knots; 2,520 pounds
4- 212 knots; 2,520 pounds

621. After level-off at FL 290, cruise EPR is set at 1.84. If the airplane gross
Y26 weight is 164,000 pounds, what indicated cruise Mach should be obtained? (Fig. 42, page 94)

1- .83 Mach
2- .81 Mach
3- .79 Mach
4- .75 Mach

622. What EPR setting is required at FL 310 to cruise at .82 Mach if the airplane
Y26 gross weight is 173,000 pounds? (Fig. 42, page 94)

1- 1.97
2- 1.93
3- 1.91
4- 1.89

623. The airplane's gross weight has decreased from 178,000 to 168,000 pounds. To
Y26 maintain .80 cruise Mach at FL 300, what decrease in the EPR setting should be made? (Fig. 42, page 94)

1- .07
2- .05
3- .03
4- .01

624. After level-off at FL 340, cruise EPR is set at 1.98. If the airplane gross
Y26 weight is 160,000 pounds, what indicated cruise Mach should be obtained? (Fig. 42, page 94)

1- .83 Mach
2- .82 Mach
3- .80 Mach
4- .76 Mach

625. At level-off, the airplane gross weight is 182,000 pounds. What EPR is required
Y26 to cruise at .82 Mach at FL 260? (Fig. 42, page 94)

1- 1.90
2- 1.88
3- 1.85
4- 1.82

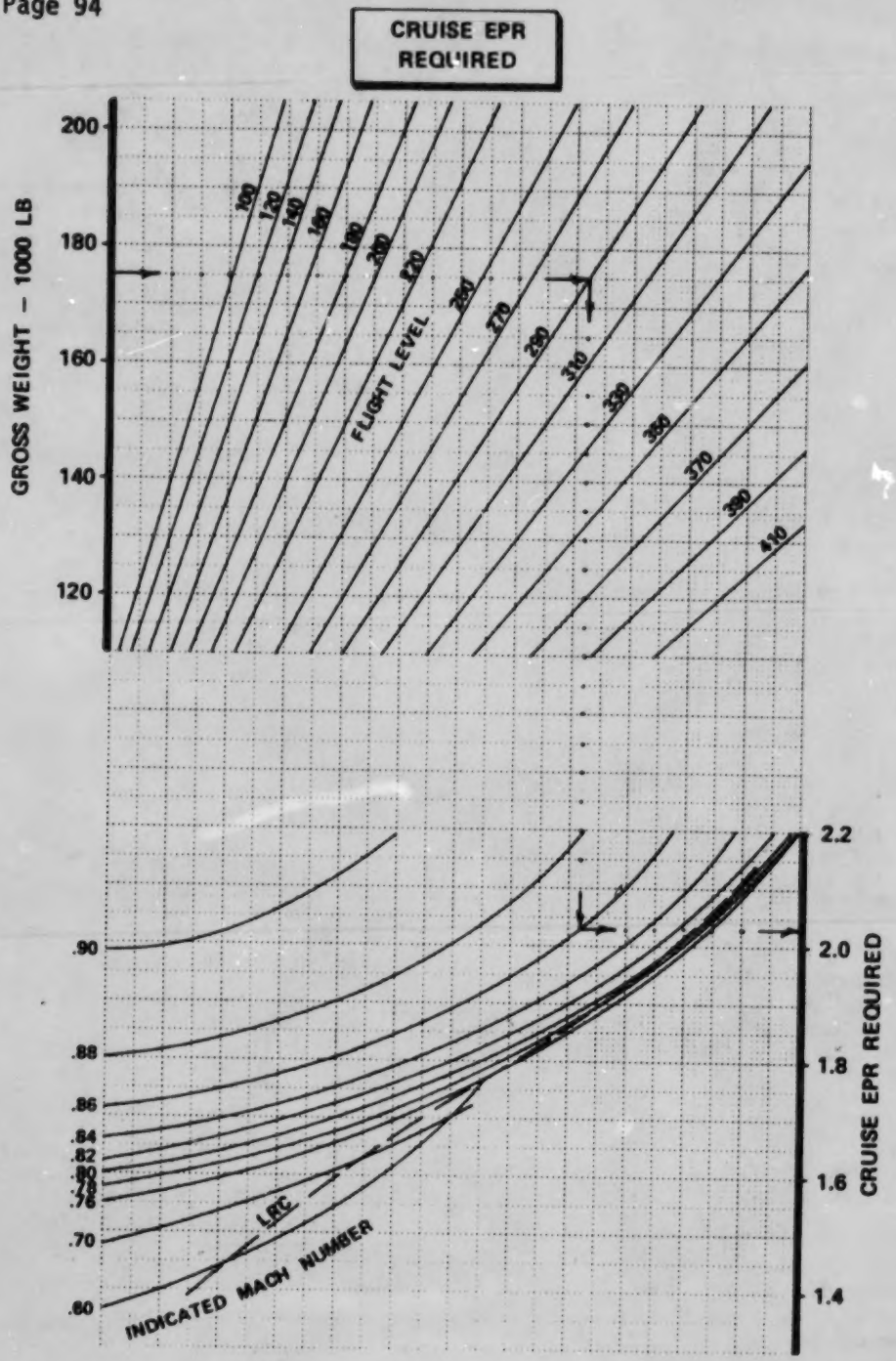

CRUISE EPR REQUIRED
GROSS WEIGHT – 1000 LB
200
180
160
140
120
FLIGHT LEVEL
100
120
140
160
180
200
220
250
270
290
310
330
350
370
390
410
.90
.88
.86
.84
.82
.80
.78
.76
.70
.60
LRC
INDICATED MACH NUMBER
2.2
2.0
1.8
1.6
1.4
CRUISE EPR REQUIRED

Figure 42

INITIAL FUEL WEIGHT 1000 LB	ENDING FUEL WEIGHT - 1000 LB															
	10	14	18	22	26	30	34	38	42	46	50	54	58	62	66	70
70	28	27	25	23	22	20	18	17	15	13	12	10	8	5	3	0
66	26	25	23	21	20	18	16	15	13	11	10	8	5	3	0	
62	23	23	20	18	17	15	13	12	10	8	7	5	3	0		
58	21	20	18	16	15	13	11	10	8	6	5	3	0			
54	18	16	15	13	12	10	8	7	5	3	2	0				
50	16	15	13	12	10	8	7	5	3	2	0					
46	15	13	12	10	8	7	5	3	2	0						
42	13	12	10	8	7	5	3	2	0							
38	12	10	8	7	5	3	2	0								
34	10	8	7	5	3	2	0									
30	8	7	5	3	2	0										
26	7	5	3	2	0											
22	5	3	2	0												
18	3	2	0													
14	2	0														
10	0															

FUEL DUMP TIME

FUEL JETTISON TIME-MINUTES

Figure 43

626. Y30 What should be the EPR and total fuel required to hold for 25 minutes at 20,000 feet pressure altitude at a gross weight of 155,000 pounds? (Fig. 41, page 93)

1- 1.51 EPR; 3,569 pounds
2- 1.53 EPR; 3,569 pounds
3- 1.53 EPR; 2,855 pounds
4- 1.55 EPR; 2,855 pounds

627. Y31 How long should it take to dump enough fuel to reach a maximum gross weight of 155,000 pounds? (Fig. 43)

Airplane gross weight at start of dump- - - 163,800 lbs.
Zero fuel weight- - - - 133,800 lbs.

1- 9 minutes
2- 7 minutes
3- 6 minutes
4- 4 minutes

628. Y31 How long should it take to dump enough fuel to have 16,000 pounds of fuel remaining? (Fig. 43)

Airplane gross weight at start of dump- - - 165,000 lbs.
Zero fuel weight- - - - 135,000 lbs.

1- 8 minutes
2- 7 minutes
3- 6 minutes
4- 5 minutes

629. Y31 How long should it take to dump enough fuel to reach a gross weight of 156,500 pounds? (Fig. 43)

Airplane gross weight at start of dump- - - 166,500 lbs.
Zero fuel weight- - - - 136,500 lbs.

1- 4 minutes
2- 5 minutes
3- 7 minutes
4- 8 minutes

630. Y31 How long should it take to dump enough fuel to reach a maximum landing weight of 142,500 pounds? (Fig. 43)

Zero fuel weight- - - - 132,500 lbs.
Airplane gross weight at start of dump- - - 176,500 lbs.

1- 15 minutes
2- 14 minutes
3- 12 minutes
4- 11 minutes

631. Y31 How long should it take to dump enough fuel to have 18,000 pounds of fuel remaining? (Fig. 43)

Zero fuel weight- - - - 137,000 lbs.
Airplane gross weight at start of dump- - - 167,000 lbs.

1- 5 minutes
2- 6 minutes
3- 7 minutes
4- 8 minutes

632. How long should it take to dump a sufficient amount of fuel to reach
Y31 a maximum weight of 154,500 pounds? (Fig. 43, page 95)

Airplane gross weight
at start of dump- - - 164,500 lbs.
Zero fuel weight- - - - 134,500 lbs.

1- 4 minutes
2- 6 minutes
3- 7 minutes
4- 8 minutes

633. How long should it take to dump a sufficient amount of fuel to have
Y31 16,000 pounds of fuel remaining? (Fig. 43, page 95)

Airplane gross weight
at start of dump- - - 165,000 lbs.
Zero fuel weight- - - - 135,000 lbs.

1- 5 minutes
2- 6 minutes
3- 7 minutes
4- 8 minutes

634. How long should it take to dump a sufficient amount of fuel so that
Y31 10,000 pounds of fuel will remain? (Fig. 43, page 95)

Airplane gross weight
at start of dump- - - 179,500 lbs.
Zero fuel weight- - - - 135,500 lbs.

1- 11 minutes
2- 12 minutes
3- 14 minutes
4- 16 minutes

635. How long should it take to dump a sufficient amount of fuel to reach
Y31 a maximum weight of 142,500 pounds? (Fig. 43, page 95)

Zero fuel weight- - - - 132,500 lbs.
Airplane gross weight
at start of dump- - - 176,500 lbs.

1- 16 minutes
2- 14 minutes
3- 12 minutes
4- 11 minutes

636. How long should it take to dump a sufficient amount of fuel to reach
Y31 a maximum weight of 155,000 pounds when the airplane zero fuel weight is 133,800 pounds? (Fig. 43, page 95)

Airplane gross weight
at start of dump- - - 163,800 lbs.

1- 9 minutes
2- 7 minutes
3- 6 minutes
4- 4 minutes

637. How long should it take to dump enough fuel so that 10,000 pounds of fuel will
Y31 remain? (Fig. 43, page 95)

Airplane gross weight
at start of dump- - - 179,500 lbs.
Zero fuel weight- - - - 135,500 lbs.

1- 12 minutes
2- 13 minutes
3- 14 minutes
4- 15 minutes

638. How long should it take to dump enough fuel to reach a gross weight of 154,500
Y31 pounds? (Fig. 43, page 95)

Airplane gross weight
at start of dump- - - 164,500 lbs.
Zero fuel weight- - - - 134,500 lbs.

1- 8 minutes
2- 7 minutes
3- 5 minutes
4- 4 minutes

639. How long should it take to dump enough fuel to reach a maximum landing weight
Y31 of 143,500 pounds? (Fig. 43, page 95)

Airplane gross weight
at start of dump- - - 175,500 lbs.
Zero fuel weight- - - - 131,500 lbs.

1- 15 minutes
2- 13 minutes
3- 12 minutes
4- 11 minutes

640. What should be the V_{REF} and maneuvering speed for FLAPS 30? (Fig. 44, page 98)

Y33

Airplane gross weight- - - 157,500 lbs.
Surface wind (RWY 24)- - - 240°/10 knots

1- 135 knots
2- 137 knots
3- 139 knots
4- 143 knots

641. What should be the EPR setting for all engines? (Fig. 44, page 98)

Y33

Pressure altitude- - - - - 2,500 feet
Outside air temperature- - 62°F.
A/C Bleeds:
Eng. 1 & 3 - - - - - - - - ON
Eng. 2 - - - - - - - - - - OFF

	Eng. 1 & 3	Eng. 2
1-	2.12	2.15
2-	2.15	2.12
3-	2.08	2.19
4-	2.16	2.11

642. What should be the EPR setting for all engines? (Fig. 44, page 98)

Y33

Pressure altitude - - - - 3,000 feet
OAT - - - - - - - - - - - - 0°F.
Engine and wing anti-ice:
One engine bleed--
all engines - - - - - ON
A/C Bleeds:
Eng. 1 & 3- - - - - - - - OFF
Eng. 2- - - - - - - - - - ON

	Eng. 1 & 3	Eng. 2
1-	2.20	2.17
2-	2.27	2.20
3-	2.14	2.24
4-	2.18	2.20

643. What should be the EPR setting for all engines? (Fig. 44, page 98)

Y33

Outside air temperature - -10°F.
Pressure altitude - - - - 2,000 feet
Engine and wing anti-ice:
Two engine bleeds--
all engines - - - - - ON
A/C Bleeds:
Eng. 1 & 3- - - - - - - - OFF
Eng. 2- - - - - - - - - - ON

	Eng. 1 & 3	Eng. 2
1-	2.13	2.13
2-	2.17	2.09
3-	2.22	2.16
4-	2.09	2.17

644. What should be the maneuvering speed for 154,000 pounds? (Fig. 44, page 98)

Y33

FLAPS - - - - - - - - - - 40
Surface wind (RWY 35) - 350° 15G 25 knots

1- 139 knots
2- 143 knots
3- 145 knots
4- 150 knots

645. What should be the EPR setting for all engines? (Fig. 44, page 98)

Y33

Pressure altitude- - - - - 1,000 feet
OAT- - - - - - - - - - - - 87°F.
A/C Bleeds: Eng. 1 & 3- - ON
Eng. 2- - - - ON

	Eng. 1 & 3	Eng. 2
1-	2.04	2.06
2-	2.06	2.08
3-	2.04	2.04
4-	2.06	2.04

646. What should be the EPR settings for all engines? (Fig. 44, page 98)

Y33

Outside air temperature- - +87°F.
Pressure altitude- - - - - 4,300 feet
A/C Bleeds: Eng. 1 & 3- - NORMAL
Eng. 2- - - - ON

	Eng. 1 & 3	Eng. 2
1-	2.02	2.04
2-	2.06	2.04
3-	2.04	2.06
4-	2.06	2.08

647. What should be the EPR settings for all engines? (Fig. 44, page 98)

Y33

Pressure altitude- - - - - 4,600 feet
Outside air temperature- - +5°F.
Engine and wing anti-ice:
Eng. 1, 2, & 3:
One engine bleed - - - - ON
A/C Bleeds: Normal bleed conditions

	Eng. 1 & 3	Eng. 2
1-	2.25	2.25
2-	2.23	2.21
3-	2.17	2.26
4-	2.26	2.26

JT8D-15

GO AROUND EPR AND LANDING SPEEDS

GO AROUND EPR

NORMAL BLEED CONDITIONS

PRESSURE ALTITUDE-FT		OAT °F	-82	-10	0	10	18	27	38	47	55	69	73	83	91	100	110	119
		°C	-63	-23	-18	-13	-8	-3	3	8	13	18	23	28	33	38	43	48
		TAT °C	-60	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45	50
-1000	ENGINE	1&3	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	1.99	1.94	1.89
		2	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.01	1.97	1.91
SEA LEVEL		1&3	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.04	1.99	1.94	1.89
		2	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.06	2.01	1.97	1.91
1000		1&3	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.09	2.09	2.09	2.08	2.04	1.99	1.94	1.89
		2	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.12	2.12	2.12	2.10	2.06	2.01	1.97	1.91
2000		1&3	2.18	2.18	2.18	2.18	2.18	2.18	2.17	2.13	2.12	2.12	2.10	2.08	2.04	1.99	1.94	1.89
		2	2.20	2.20	2.20	2.20	2.20	2.20	2.19	2.16	2.15	2.15	2.13	2.10	2.06	2.01	1.97	1.91
3000		1&3	2.24	2.24	2.24	2.24	2.23	2.20	2.17	2.13	2.12	2.12	2.10	2.08	2.04	1.99	1.94	1.89
		2	2.27	2.27	2.27	2.27	2.25	2.22	2.19	2.16	2.15	2.15	2.13	2.10	2.06	2.01	1.97	1.91
3900 AND ABOVE		1&3	2.30	2.30	2.28	2.26	2.23	2.20	2.17	2.13	2.12	2.12	2.10	2.08	2.04	1.99	1.94	1.89
		2	2.32	2.32	2.30	2.28	2.25	2.22	2.19	2.16	2.15	2.15	2.13	2.10	2.06	2.01	1.97	1.91

EPR BLEED CORRECTIONS		ENG 1&3	ENG 2
		OFF	ON
A/C BLEEDS		+.04	+.04
ENGINE ANTI-ICE ON		--	+.03
ENGINE AND WING ANTI-ICE	TWO ENGINE BLEEDS	-.09	+.03
	ONE ENGINE BLEED	-.10	+.03

FLAP EXTENSION/ MANEUVERING SPEEDS

FLAPS	BELOW 154,500	154,501 TO 176,000
	APPROACH NORMAL MANEUVERING SPEED	
0	200	210
2	190	200
5	160	170
15	150	160
25	140	150
30	V_{REF}+4	V_{REF}+4
40	V_{REF}*	V_{REF}*

*ADD WIND FACTOR OF: 1/2 HEADWIND COMPONENT + GUST (MAX: 20 KTS)

LANDING SPEEDS

GROSS WT 1000 LB	SPEED V_{REF}*
180	147
175	145
170	142
165	139
160	136
155	133
150	130
145	127
140	125
135	122
130	119
125	116
120	113
115	110
110	108

Figure 44

648. What is the cruise pressure altitude most appropriate for an IFR westbound
Y41 flight above FL 180 if the trip distance is 235 NM and the OAT is ISA +10°C? (Fig. 45, page 100)

1- FL 220
2- FL 240
3- FL 260
4- FL 280

649. What should be the EPR setting for all engines? (Fig. 44)
Y33

Pressure altitude- - - - 4,100 feet
OAT- - - - - - - - - - - -5°F.
Engine and wing anti-ice:
One engine bleed--
all engines- - - - - ON
A/C Bleeds:
Eng. 1 & 3 - - - - - - - ON
Eng. 2 - - - - - - - - - OFF

	Eng. 1 & 3	Eng. 2
1-	2.13	2.24
2-	2.19	2.28
3-	2.19	2.19
4-	2.28	2.28

650. What should be the landing speed and maneuvering speed? (Fig. 44)
Y33

Airspeed gross weight- - - 142,500 lbs.
Wind factor- - - - - - - - 24G 30 knots
Flaps- - - - - - - - - - - - 30

	Landing Speed	Maneuvering Speed
1-	130	138
2-	126	142
3-	130	150
4-	126	144

651. What should be the EPR setting for all engines? (Fig. 44)
Y33

Outside air temperature - - 62°F.
Pressure altitude - - - - - 2,500 feet
A/C Bleeds:
Eng. 1 & 3- - - - - - - - - ON
Eng. 2- - - - - - - - - - - OFF

	Eng. 1 & 3	Eng. 2
1-	2.12	2.15
2-	2.14	2.14
3-	2.11	2.12
4-	2.14	2.11

652. What should be the EPR setting for all engines? (Fig. 44)
Y33

Pressure altitude- - - - - 3,500 feet
OAT- - - - - - - - - - - - - 71°F.
A/C Bleeds:
Eng. 1 & 3 - - - - - - - - OFF
Eng. 2 - - - - - - - - - - ON

	Eng. 1 & 3	Eng. 2
1-	2.15	2.11
2-	2.07	2.18
3-	2.11	2.14
4-	2.15	2.10

653. What should be the EPR setting for all engines with engine anti-ice ON?
Y33 (Fig. 44)

Pressure altitude- - - - - 2,000 feet
OAT- - - - - - - - - - - - - 71°F.

	Eng. 1 & 3	Eng. 2
1-	2.08	2.12
2-	2.14	2.11
3-	2.11	2.11
4-	2.11	2.14

654. What is the cruise pressure altitude most appropriate for an IFR eastbound
Y41 flight above FL 180 if the trip distance is 310 NM and the OAT is ISA +5°C? (Fig. 45, page 100)

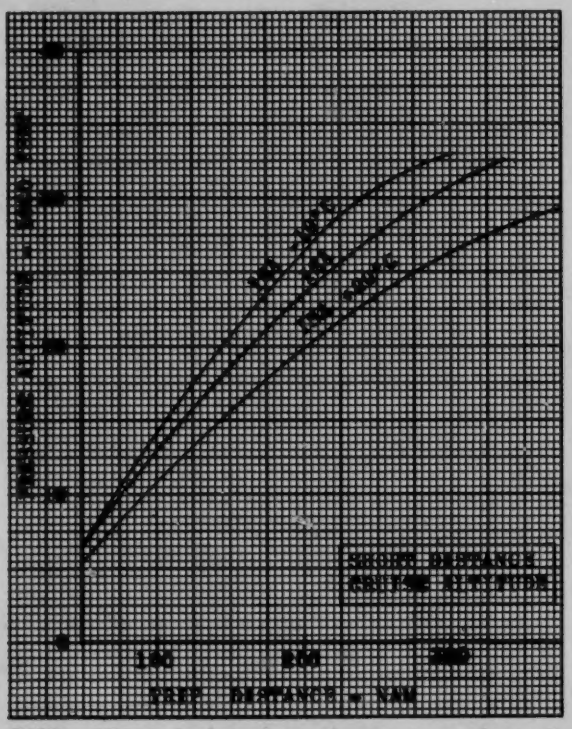
1- FL 330
2- FL 310
3- FL 300
4- FL 290

655. What is the cruise pressure altitude most appropriate for an IFR eastbound
Y41 flight above FL 180 if the trip distance is 255 NM and the OAT is ISA -10°C? (Fig. 45, page 100)

1- FL 290 or FL 310
2- FL 270 or FL 310
3- FL 290 or FL 330
4- FL 310 or FL 340

656. What is the cruise pressure altitude most appropriate for an IFR westbound
Y41 flight above FL 180 if the trip distance is 275 NM and the OAT is ISA? (Fig. 45, page 100)

1- FL 280
2- FL 300
3- FL 310
4- FL 320



NOTE: Chart is based on the maximum altitude at which it is possible to cruise at least 1/3 of the total trip distance. The remaining 2/3 of the trip distance is for climb and descent.

For planning purposes, use 300/.78 for climb and .85/350 (250 below 10,000) for descent.

Figure 45

657. What is the cruise pressure altitude most appropriate for an IFR eastbound
Y41 flight above FL 180 if the trip distance is 325 NM and the OAT is ISA? (Fig. 45)

1- FL 290
2- FL 320
3- FL 330
4- FL 340

658. What is the cruise pressure altitude most appropriate for an IFR westbound
Y41 flight below FL 180 if the trip distance is 275 NM and the OAT is ISA +10°C? (Fig. 45)

1- FL 240 or FL 260
2- FL 230 or FL 250
3- FL 260 or FL 290
4- FL 260 or FL 280

659. What is the cruise pressure altitude most appropriate for an IFR westbound flight
Y41 above FL 180 if the trip distance is 350 NM and the OAT is ISA +10°C? (Fig. 45)

1- FL 290
2- FL 310
3- FL 320
4- FL 330

660. What is the cruise pressure altitude most appropriate for an IFR eastbound
Y41 flight above FL 180 if the trip distance is 300 NM and the OAT is ISA +15°C? (Fig. 45)

1- FL 250 or FL 270
2- FL 270 or FL 310
3- FL 270 or FL 290
4- FL 290 or FL 310

661. What is the cruise pressure altitude most appropriate for an IFR westbound
Y41 flight above FL 180 if the trip distance is 300 NM and the OAT is ISA? (Fig. 45)

1- FL 320
2- FL 310
3- FL 300
4- FL 290

662. What is the cruise pressure altitude most appropriate for an IFR eastbound
Y41 flight above FL 180 if the trip distance is 350 NM and the OAT is ISA +20°C? (Fig. 45)

1- FL 270
2- FL 290
3- FL 310
4- FL 330

SIMPLIFIED FLIGHT PLANNING

OPERATING CONDITIONS	O-1	O-2	O-3	O-4	O-5
Trip distance (NM)	1,000	700	1,300	500	1,500
Average wind factor	+100 kts.	+25 kts.	-75 kts.	-25 kts.	+60 kts.
Cruise press. alt.	FL 250	FL 290	FL 310	FL 190	FL 350
Outside air temp.	-25°C.	-48°C.	-37°C.	-13°C.	-50°C.
Landing weight	125,000	131,000	105,000	135,000	140,000

Figure 46

663. Y40 Determine the approximate amount of time and fuel required under Conditions O-1. (Fig. 46; Fig. 47, page 102)

1- 2 hours 00 minutes; 19,800 pounds.
2- 1 hour 50 minutes; 18,000 pounds.
3- 2 hours 10 minutes; 21,000 pounds.
4- 2 hours 20 minutes; 23,500 pounds.

664. Y40 Determine the approximate amount of time and fuel required under Conditions O-2. (Fig. 46; Fig. 47, page 102)

1- 1 hour 55 minutes; 16,900 pounds.
2- 1 hour 50 minutes; 16,000 pounds.
3- 1 hour 40 minutes; 14,800 pounds.
4- 1 hour 30 minutes; 14,000 pounds.

665. Y40 Determine the approximate amount of time and fuel required under Conditions O-3. (Fig. 46; Fig. 47, page 102)

1- 3 hours 30 minutes; 30,000 pounds.
2- 3 hours 25 minutes; 27,500 pounds.
3- 3 hours 20 minutes; 26,000 pounds.
4- 3 hours 10 minutes; 25,500 pounds.

666. Y40 Determine the approximate amount of time and fuel required under Conditions O-4. (Fig. 46; Fig. 47, page 102)

1- 1 hour 25 minutes; 16,500 pounds.
2- 1 hour 20 minutes; 16,300 pounds.
3- 1 hour 10 minutes; 15,800 pounds.
4- 1 hour 00 minutes; 14,000 pounds.

667. Y40 Determine the approximate amount of time and fuel required under Conditions O-5. (Fig. 46; Fig. 47, page 102)

1- 3 hours 10 minutes; 27,800 pounds.
2- 3 hours 00 minutes; 26,000 pounds.
3- 2 hours 50 minutes; 24,500 pounds.
4- 2 hours 45 minutes; 23,500 pounds.

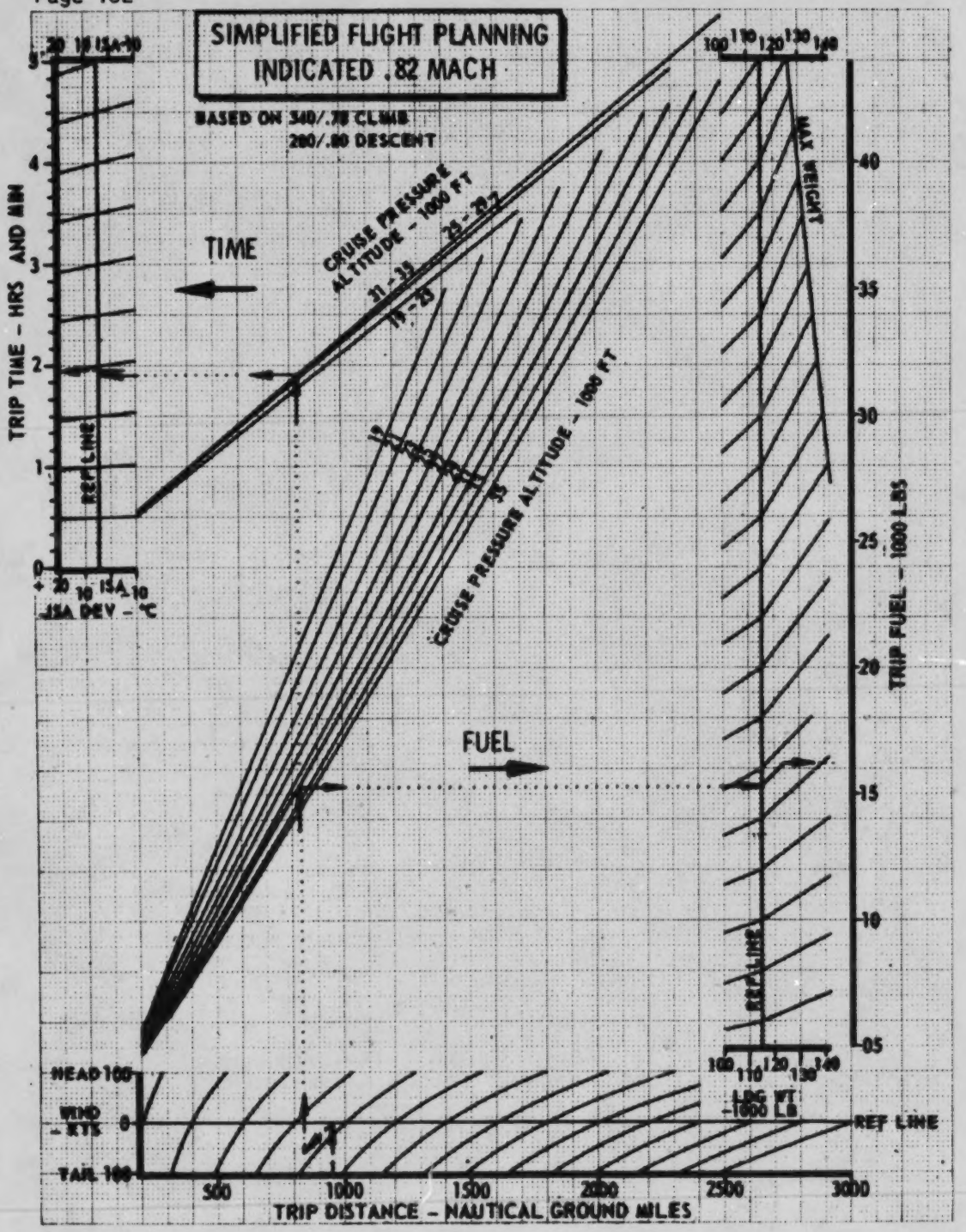

SIMPLIFIED FLIGHT PLANNING
INDICATED .82 MACH
BASED ON 340/.78 CLIMB
280/.80 DESCENT
TRIP TIME - HRS AND MIN
TIME
CRUISE PRESSURE ALTITUDE - 1000 FT
31 - 33
25 - 27
19 - 23
CRUISE PRESSURE ALTITUDE - 1000 FT
FUEL
MAX WEIGHT
TRIP FUEL - 1000 LBS
REF LINE
ISA DEV - °C
HEAD
WIND - KTS
TAIL
LDG WT - 1000 LB
REF LINE
TRIP DISTANCE - NAUTICAL GROUND MILES

Figure 47

SIMPLIFIED FLIGHT PLANNING

OPERATING CONDITIONS	P-1	P-2	P-3	P-4	P-5
Trip distance (NM)	800	1,100	900	1,200	1,400
Average wind factor	-25 kts.	+75 kts.	-60 kts.	-50 kts.	+50 kts.
Cruise press. alt.	FL 210	FL 230	FL 290	FL 340	FL 330
Outside air temp.	-32°C.	-41°C.	-33°C.	-43°C.	-56°C.
Landing weight	140,000	140,000	135,000	125,000	130,000

Figure 48

668. What is the approximate time and fuel required under Conditions O-5?
Y40 (Fig. 47 and Fig. 48)

1- 2 hours 10 minutes; 27,000 pounds.
2- 2 hours 00 minutes; 24,600 pounds.
3- 1 hour 50 minutes; 23,500 pounds.
4- 1 hour 45 minutes; 22,000 pounds.

669. What is the approximate time and fuel required under Conditions O-4?
Y40 (Fig. 47 and Fig. 48)

1- 2 hours 25 minutes; 27,800 pounds.
2- 2 hours 20 minutes; 26,000 pounds.
3- 2 hours 15 minutes; 25,800 pounds.
4- 2 hours 05 minutes; 24,000 pounds.

670. What is the approximate time and fuel required under Conditions O-3?
Y40 (Fig. 47 and Fig. 48)

1- 2 hours 15 minutes; 22,500 pounds.
2- 2 hours 10 minutes; 18,800 pounds.
3- 2 hours 05 minutes; 18,000 pounds.
4- 2 hours 00 minutes; 17,600 pounds.

671. What is the approximate time and fuel required under Conditions O-2?
Y40 (Fig. 47 and Fig. 48)

1- 3 hours 15 minutes; 28,500 pounds.
2- 3 hours 05 minutes; 26,000 pounds.
3- 2 hours 55 minutes; 24,500 pounds.
4- 2 hours 45 minutes; 22,500 pounds.

672. What is the approximate time and fuel required under Conditions O-1?
Y40 (Fig. 47 and Fig. 48)

1- 3 hours 05 minutes; 27,500 pounds.
2- 3 hours 00 minutes; 26,500 pounds.
3- 2 hours 50 minutes; 24,000 pounds.
4- 2 hours 52 minutes; 22,500 pounds.

FLIGHT TIME ANALYSIS

CHECK POINTS		ROUTE	MACH NO.	WIND FACTOR	SPEED-KNOTS		DIST N.M.	TIME		FUEL CONSUMPTION (POUNDS)	
FROM	TO	ALTITUDE FLT/LEVEL		TEMPERATURE	TAS	GRND SPEED		LEG	TOTAL	LEG	TOTAL
EL PASO INTL.	LEVEL OFF	J2-50 CLIMB	--	----- -----	—	--	85	—	:15	---	*5,500
LEVEL OFF	SSO VORTAC	J-50 FL 310		-35 knots ISA -3°C.							
SSO VORTAC	CZG VORTAC	J4-50 FL 310		-35 knots ISA -3°C.							
CZG VORTAC	TNP VORTAC	J4-104 FL 310		-35 knots ISA -3°C.							
TNP VORTAC	CIVET INT.	TNP CIVET 1 FL 310		----- -----							
CIVET INT.	LOS ANGELES INTL.	------ DESCENT	& &	----- APPROACH	—	--	---	:11		1,200	

OTHER DATA:

*INCLUDES 1,000 LBS. FUEL FOR TAXI ALLOWANCE.

NOTE: Use 10,500 PPH total fuel flow from level-off to the CIVET INT.

Use 9,400 PPH total fuel flow for reserve requirement.

FLIGHT SUMMARY

TIME	FUEL	
		ENROUTE
		RESERVE
--	1,000	MISSED APPROACH
		TOTAL

Figure 49

Questions 673, 674, 675, and 676 refer to a flight from El Paso International Airport to Los Angeles International Airport. Refer to the: (1) Flight Time Analysis, Fig. 49; (2) Enroute High Altitude Chart excerpts, Fig. 50, page 106; and (3) STAR, Fig. 51, page 107.

673. What is the ETE at .78 Mach?

X11
1- 1 hour 43 minutes
2- 1 hour 40 minutes
3- 1 hour 37 minutes
4- 1 hour 34 minutes

674. What is the total fuel required at .78 Mach?

X12
1- 25,200 pounds
2- 26,000 pounds
3- 26,800 pounds
4- 27,000 pounds

675. What is the specific range in nautical air miles per 1,000 pounds of fuel from level-off to the CZG VORTAC using .78 Mach?

X14
1- 44.5 NAM/1,000
2- 43.3 NAM/1,000
3- 41.2 NAM/1,000
4- 39.9 NAM/1,000

676. What approximate indicated Mach should be maintained to arrive over the CZG VORTAC 28 minutes after level-off?

X13
1- .84 Mach
2- .82 Mach
3- .80 Mach
4- .79 Mach

Questions 677, 678, 679, and 680 refer to a flight from El Paso International Airport to Los Angeles International Airport. Refer to the: (1) Flight Time Analysis, Fig. 49; (2) Enroute High Altitude Chart excerpts, Fig. 50, page 106; and (3) STAR, Fig. 51, page 107.

677. What is the ETE at .80 Mach?

X11
1- 1 hour 38 minutes
2- 1 hour 35 minutes
3- 1 hour 32 minutes
4- 1 hour 29 minutes

678. What is the total fuel required at .80 Mach?

X12
1- 27,500 pounds
2- 26,800 pounds
3- 25,700 pounds
4- 25,000 pounds

679. What is the specific range in nautical air miles per 1,000 pounds of fuel from
X14 level-off to the TNP VORTAC using .80 Mach?

1- 45.4 NAM/1,000
2- 44.3 NAM/1,000
3- 43.1 NAM/1,000
4- 40.9 NAM/1,000

680. What approximate indicated Mach should be maintained to arrive over the TNP
X13 VORTAC 58 minutes after level-off?

1- .85 Mach
2- .84 Mach
3- .83 Mach
4- .81 Mach

Questions 681, 682, 683, and 684 refer to a flight from El Paso International Airport to Los Angeles International Airport. Refer to the: (1) Flight Time Analysis, Fig. 49; (2) Enroute High Altitude Chart excerpts, Fig. 50, page 106; and (3) STAR, Fig. 51, page 107.

681. What is the ETE at .82 Mach?

X11
1- 1 hour 33 minutes
2- 1 hour 30 minutes
3- 1 hour 27 minutes
4- 1 hour 25 minutes

682. What is the total fuel required at .82 Mach?

X12
1- 26,500 pounds
2- 25,400 pounds
3- 23,300 pounds
4- 22,400 pounds

683. What is the specific range in nautical air miles per 1,000 pounds of fuel from
X14 the SSO VORTAC to the TNP VORTAC using .82 Mach?

1- 46.8 NAM/1,000
2- 45.4 NAM/1,000
3- 43.9 NAM/1,000
4- 42.0 NAM/1,000

684. What approximate indicated Mach should be maintained to arrive over the TNP
X13 VORTAC 48 minutes after passing the SSO VORTAC?

1- .84 Mach
2- .83 Mach
3- .82 Mach
4- .81 Mach

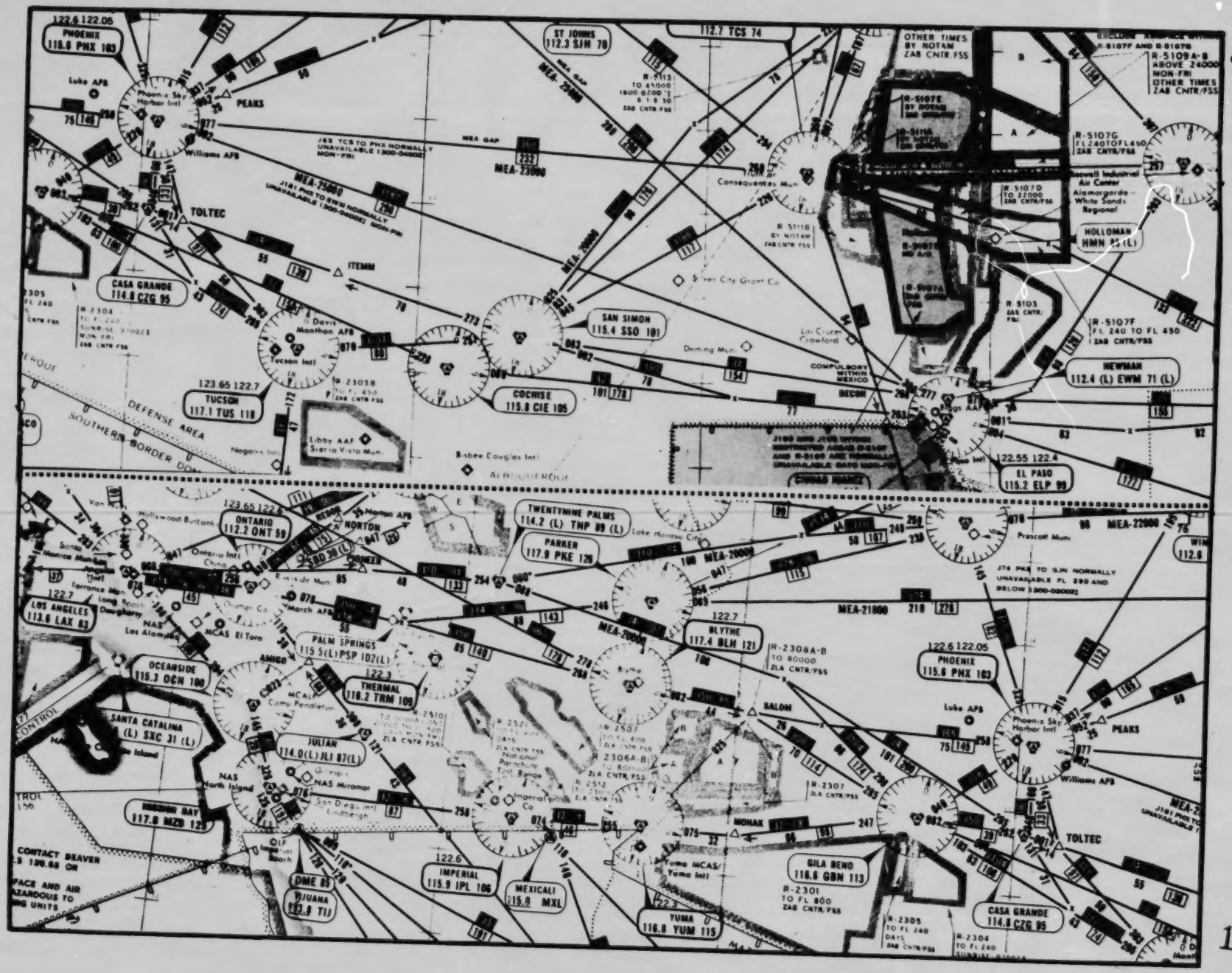
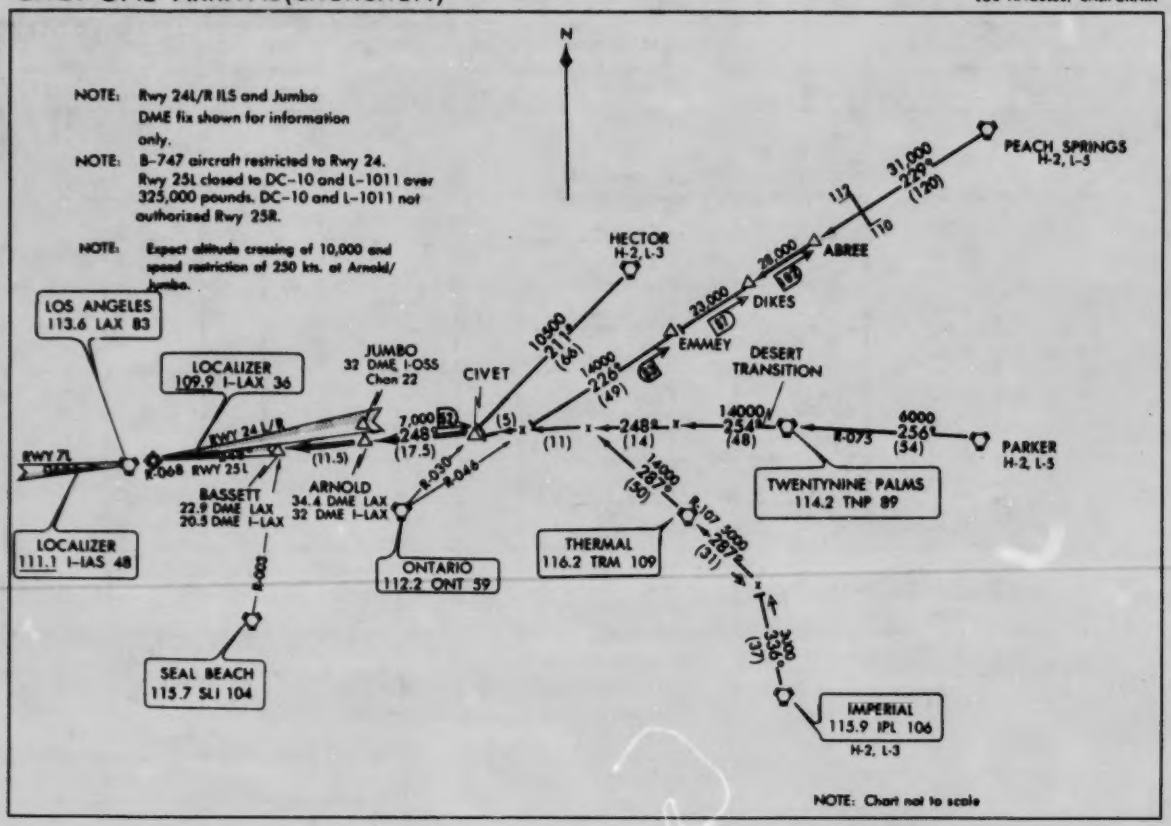

PHOENIX
115.6 PNX 103
122.6 122.05
Luke AFB
Phoenix Sky Harbor Intl
PEAKS
Williams AFB
TOLTEC
CASA GRANDE
114.6 CZG 95
ITEMM
ST JOHNS
112.3 SJN 70
MEA GAP
MEA-23000
MEA-25000
SAN SIMON
115.4 SSO 101
COCHISE
115.8 CIE 105
Davis Monthan AFB
Tucson Intl
TUCSON
117.1 TUS 118
123.65 122.7
DEFENSE AREA
SOUTHERN BORDER DCA
Nogales Intl
Libby AAF
Sierra Vista Mun
Bisbee Douglas Intl
ALBUQUERQUE
Consequentes Mun
Silver City Grant Co
Deming Mun
Las Cruces Crawford
COMPULSORY WITHIN MEXICO
BECON
HOLLOMAN
HMN 113.6 (L)
NEWMAN
112.4 (L) EWM 71 (L)
EL PASO
115.2 ELP 99
122.55 122.4
Prescott Muni
MEA-22000
MEA-21000
MEA-20000
TWENTYNINE PALMS
114.2 (L) TNP 89 (L)
PARKER
117.9 PKE 126
ONTARIO
112.2 ONT 59
NORTON
Norton AFB
Ontario Intl
Chino
Riverside Muni
March AFB
Hollywood Burbank
Van Nuys
Santa Monica Muni
Torrance Muni
Long Beach Daugherty
NAS Los Alamitos
MCAS El Toro
LOS ANGELES
113.6 LAX 83
122.7
PALM SPRINGS
115.5 (L) PSP 102 (L)
OCEANSIDE
115.3 OCN 100
THERMAL
116.2 TRM 109
122.3
MCAS Camp Pendleton
SANTA CATALINA
(L) SXC 31 (L)
JULIAN
114.0 (L) JLI 87 (L)
NAS North Island
NAS Miramar
San Diego Intl Lindbergh
MISSION BAY
117.8 MZB 125
CONTACT BEAVER
DME 85
TIJUANA
IMPERIAL
115.9 IPL 106
122.6
MEXICALI
115.9 MXL
YUMA
116.8 YUM 115
Yuma MCAS/ Yuma Intl
GILA BEND
116.6 GBN 113
R-2301
TO FL 600
ZAB CNTR/FSS
BLYTHE
117.4 BLH 121
122.7
R-2308A-B
TO 60000
ZLA CNTR/FSS
R-2306A-B
R-2307
R-2305
R-2304
TO FL 240
SUNRISE-SUNSET
MON-FRI
ZAB CNTR FSS
R-2303
TO FL 240
DAYS
ZAB CNTR/FSS
SALOM
MOHAK
PHOENIX
115.6 PNX 103
122.6 122.05
CASA GRANDE
114.6 CZG 95
R-5107E
BY NOTAM
ZAB CNTR/FSS
R-5107G
FL 240 TO FL 450
ZAB CNTR/FSS
R-5107F
FL 240 TO FL 450
ZAB CNTR/FSS
R-5107D
TO 22000
ZAB CNTR/FSS
R-5109A-B
ABOVE 24000
MON-FRI
OTHER TIMES
ZAB CNTR/FSS
OTHER TIMES
BY NOTAM
ZAB CNTR FSS
R-5110
BY NOTAM
ZAB CNTR FSS
R-5103
ZAB CNTR/FSS
Alamogordo White Sands Regional
R-2310
R-2512
R-2510
R-2508
R-2306A-B
R-2307
ZLA CNTR/FSS
Imperial Co
Yuma MCAS/ Yuma Intl
JOSHUA
MEA-21000
274 PRM TO SJN NORMALLY UNAVAILABLE FL 290 AND BELOW 1300-0800Z
JOB TCS TO PHX NORMALLY UNAVAILABLE 1300-0400Z
MON-FRI
R-5113
TO 41000
1600-0700Z
ZAB CNTR FSS
112.7 TCS 74
R-2100 AND 2101 WITHIN RESTRICTED AREAS R-2107 AND R-2108 ARE UNAVAILABLE OTHER TIMES
CHOAD RANGE

Figure 50

CIVET ONE ARRIVAL (CIVET.CIVET1)

LOS ANGELES INTERNATIONAL
LOS ANGELES, CALIFORNIA


N
NOTE: Rwy 24L/R ILS and Jumbo DME fix shown for information only.
NOTE: B-747 aircraft restricted to Rwy 24. Rwy 25L closed to DC-10 and L-1011 over 325,000 pounds. DC-10 and L-1011 not authorized Rwy 25R.
NOTE: Expect altitude crossing of 10,000 and speed restriction of 250 kts. at Arnold/Jumbo.
PEACH SPRINGS H-2, L-5
ABREE
DIKES
EMMEY
HECTOR H-2, L-3
LOS ANGELES 113.6 LAX 83
LOCALIZER 109.9 I-LAX 36
JUMBO 32 DME I-OSS Chan 22
CIVET
DESERT TRANSITION
PARKER H-2, L-5
TWENTYNINE PALMS 114.2 TNP 89
RWY 24 L/R
RWY 25L
RWY 7L
BASSETT 22.9 DME LAX 20.5 DME I-LAX
ARNOLD 34.4 DME LAX 32 DME I-LAX
LOCALIZER 111.1 I-IAS 48
ONTARIO 112.2 ONT 59
THERMAL 116.2 TRM 109
SEAL BEACH 115.7 SLI 104
IMPERIAL 115.9 IPL 106 H-2, L-3
NOTE: Chart not to scale

CIVET ONE ARRIVAL (CIVET.CIVET1)

LOS ANGELES INTERNATIONAL
LOS ANGELES, CALIFORNIA

ARRIVAL ROUTE DESCRIPTION

DESERT TRANSTION (TNP.CIVET1): From over TWENTYNINE PALMS VORTAC via TWENTYNINE PALMS R-254 and LOS ANGELES R-068 to CIVET INT. Thence . . . .

HECTOR TRANSITION (HEC.CIVET1): From over HECTOR VORTAC via HECTOR R-211 and ONTARIO R-030 to CIVET INT. Thence . . . .

IMPERIAL TRANSITION (IPL.CIVET1): From over IMPERIAL VORTAC via IMPERIAL R-336 and THERMAL R-107 and R-287 and LOS ANGELES R-068 to CIVET INT. Thence . . . .

PARKER TRANSITION (PKE.CIVET1): From over PARKER VORTAC via PARKER R-256 and TWENTYNINE PALMS R-075 to TWENTYNINE PALMS VORTAC. Via TWENTYNINE PALMS R-254 and LOS ANGELES R-068 to CIVET INT. Thence . . . .

PEACH SPRINGS TRANSITION (PGS.CIVET1): From over PEACH SPRINGS VORTAC via PEACH SPRINGS R-229 and ONTARIO R-046 and LOS ANGELES R-068 to CIVET INT. Thence . . . .

. . . . From CIVET INT. via LOS ANGELES ILS Rwy 25L Localizer east course/LAX R-068 via ARNOLD DME Fix to BASSETT INT. Expect ILS approach from Bassett Int, expect altitude crossing of 10,000' and speed restriction of 250 kts. at Arnold/Jumbo.

CIVET ONE ARRIVAL (CIVET.CIVET1)

LOS ANGELES, CALIFORNIA
LOS ANGELES INTERNATIONAL

Figure 51

FLIGHT TIME ANALYSIS

CHECK POINTS		ROUTE	MACH NO.	WIND FACTOR	SPEED-KNOTS		DIST N.M.	TIME		FUEL CONSUMPTION (POUNDS)	
FROM	TO	ALTITUDE FLT/LEVEL		TEMPERATURE	TAS	GRND SPEED		LEG	TOTAL	LEG	TOTAL
LOS ANGELES INTL.	SLI VORTAC	RADAR VECTOR CLIMB	--	---- ----	--	--	---	--	—	---	---
SLI VORTAC	TRM VORTAC (LEVEL-OFF)	SL15, BLH CLIMB	--	---- ----	--	--	---	--	:12	---	*6,600
TRM VORTAC	BLH VORTAC	SL15, BLH FL 330		+27 knots ISA -1°C.							
BLH VORTAC	SSO VORTAC	J50 FL 330		+27 knots ISA -1°C.							
SSO VORTAC	ELP VORTAC	J50 FL 330		+27 knots ISA -1°C.							
ELP VORTAC	EL PASO INTL.	--- DESCENT	&	---- APPROACH	—	—	---	:12		1,200	

OTHER DATA:

*INCLUDES 1,000 LBS. FUEL FOR TAXI ALLOWANCE.

NOTE: Use 9,050 PPH total fuel flow from TRM VORTAC (level-off) to the ELP VORTAC.

Use 8,850 PPH total fuel flow for reserve requirements.

FLIGHT SUMMARY

TIME	FUEL	
		ENROUTE
		RESERVE
--	1,200	MISSED APPROACH
		TOTAL

Figure 52

Questions 685, 686, 687, and 688 refer to a flight from Los Angeles International Airport to El Paso International Airport. Refer to the: (1) Flight Time Analysis, Fig. 52; (2) SID, Fig. 53, page 110; and (3) Enroute High Altitude Chart excerpts, Fig. 54, page 111.

685. What is the ETE at .78 Mach?

X11
1- 1 hour 31 minutes
2- 1 hour 29 minutes
3- 1 hour 27 minutes
4- 1 hour 25 minutes

686. What is the total fuel required at .78 Mach?

X12
1- 26,500 pounds
2- 25,400 pounds
3- 24,300 pounds
4- 23,100 pounds

687. What is the specific range in nautical air miles per 1,000 pounds of fuel from level-off to the SSO VORTAC using .78 Mach?

X14
1- 52.9 NAM/1,000
2- 51.5 NAM/1,000
3- 49.9 NAM/1,000
4- 48.7 NAM/1,000

688. What approximate indicated Mach should be maintained to arrive over the SSO VORTAC 44 minutes after level-off?

X13
1- .81 Mach
2- .80 Mach
3- .79 Mach
4- .76 Mach

Questions 689, 690, 691, and 692 refer to a flight from Los Angeles International Airport to El Paso International Airport. Refer to the: (1) Flight Time Analysis, Fig. 52; (2) SID, Fig. 53, page 110; and (3) Enroute High Altitude Chart excerpts, Fig. 54, page 111.

689. What is the ETE at .80 Mach?

X11
1- 4 hours 25 minutes
2- 3 hours 27 minutes
3- 2 hours 30 minutes
4- 1 hour 32 minutes

690. What is the total fuel required at .80 Mach?

X12
1- 27,500 pounds
2- 26,300 pounds
3- 25,100 pounds
4- 24,200 pounds

691. What is the specific range in nautical air miles per 1,000 pounds of fuel from level-off to the ELP VORTAC using .80 Mach?
X14

1- 54.2 NAM/1,000
2- 51.3 NAM/1,000
3- 49.9 NAM/1,000
4- 48.3 NAM/1,000

692. What approximate indicated Mach should be maintained to arrive over the ELP VORTAC 1 hour and 7 minutes after level-off?
X13

1- .79 Mach
2- .78 Mach
3- .77 Mach
4- .76 Mach

Questions 693, 694, 695, and 696 refer to a flight from Los Angeles International Airport to El Paso International Airport. Refer to the: (1) Flight Time Analysis, Fig. 52; (2) SID, Fig. 53, page 110; and (3) Enroute High Altitude Chart excerpts, Fig. 54, page 111.

693. What is the ETE at .82 Mach?

X11
1- 1 hour 26 minutes
2- 1 hour 24 minutes
3- 1 hour 22 minutes
4- 1 hour 20 minutes

694. What is the total fuel required at .82 Mach?

X12
1- 24,900 pounds
2- 25,800 pounds
3- 26,000 pounds
4- 25,200 pounds

695. What is the specific range in nautical air miles per 1,000 pounds of fuel from the BLH VORTAC to the ELP VORTAC using .82 Mach?
X14

1- 55.3 NAM/1,000
2- 53.5 NAM/1,000
3- 52.5 NAM/1,000
4- 50.1 NAM/1,000

696. What approximate indicated Mach should be maintained to arrive over the ELP VORTAC 53 minutes after passing the BLH VORTAC?
X13

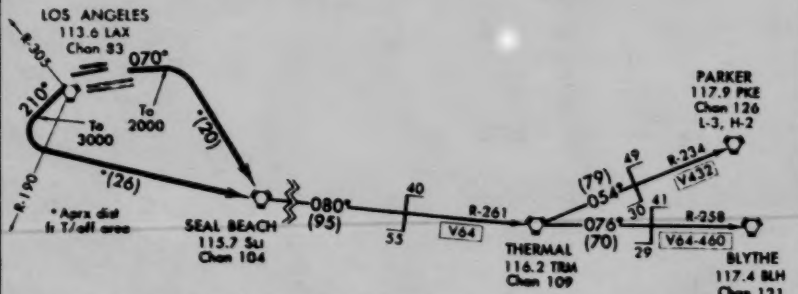
1- .86 Mach
2- .85 Mach
3- .84 Mach
4- .83 Mach

SEAL BEACH FIVE DEPARTURE (SLI5.SLI)

LOS ANGELES INTL
LOS ANGELES, CALIFORNIA

LOS ANGELES GND CON
121.65(N) 121.75 (S) 327.0
LOS ANGELES CLNC DEL
121.4
LOS ANGELES TOWER
S 118.9 379.1
N 120.8 239.3
LOS ANGELES DEP CON
124.3 363.2
ATIS
135.65

NOTE: MAINTAIN BELOW 2500' TO SHORELINE WESTBOUND OR SAN DIEGO FREEWAY EASTBOUND TO AVOID VFR CORRIDOR THROUGH LOS ANGELES TCA.



NOTE: THIS IS A RADAR VECTOR DEPARTURE TO SEAL BEACH. ROUTE DEPICTED IS A LOST COMMUNICATION PROCEDURE ONLY.

NOTE: Use the OCEAN SID noise abatement DEPARTURE during the period 2100-0700 local time in lieu of this SID.

DEPARTURE ROUTE DESCRIPTION

Take-off Runway 25/24: Climb via heading 250° for vector to SEAL BEACH VORTAC. Then via (transition) or (assigned route). Departure Control frequency will be 124.3. Aircraft filing FL 240 or above expect further clearance to filed flight level ten minutes after departure. LOST COMMUNICATIONS: If not in contact with Departure Control one minute after crossing the shoreline or the LOS ANGELES VORTAC R-190 or R-305, turn left heading 210° to 3000', continue climb via direct SEAL BEACH VORTAC.

(Continued on next page)

ELEV 126

SEAL BEACH FIVE DEPARTURE (SLI5.SLI)
LOS ANGELES, CALIFORNIA
LOS ANGELES INTL

Figure 53

SEAL BEACH FIVE DEPARTURE (SLI5.SLI)
LOS ANGELES INTL
LOS ANGELES, CALIFORNIA

DEPARTURE ROUTE DESCRIPTION
(Continued)

Take-off Runway 7/6: Climb via heading 070° for vector to SEAL BEACH VORTAC. Then via (transition) or (assigned route). Departure Control frequency will be 124.3. Aircraft filing FL 240 or above expect further clearance to filed flight level ten minutes after departure.
LOST COMMUNICATIONS: If not in contact with Departure Control after reaching 2000', continue climb turn right direct SEAL BEACH VORTAC.

BLYTHE TRANSITION (SLI5.BLH): Via SEAL BEACH R-080 and THERMAL R-261 to THERMAL VORTAC. Then via THERMAL R-076 and BLYTHE R-258 to BLYTHE VORTAC.

PARKER TRANSITION (SLI5.PKE): Via SEAL BEACH R-080 and THERMAL R-261 to THERMAL VORTAC. Then via THERMAL R-054 and PARKER R-234 to PARKER VORTAC.

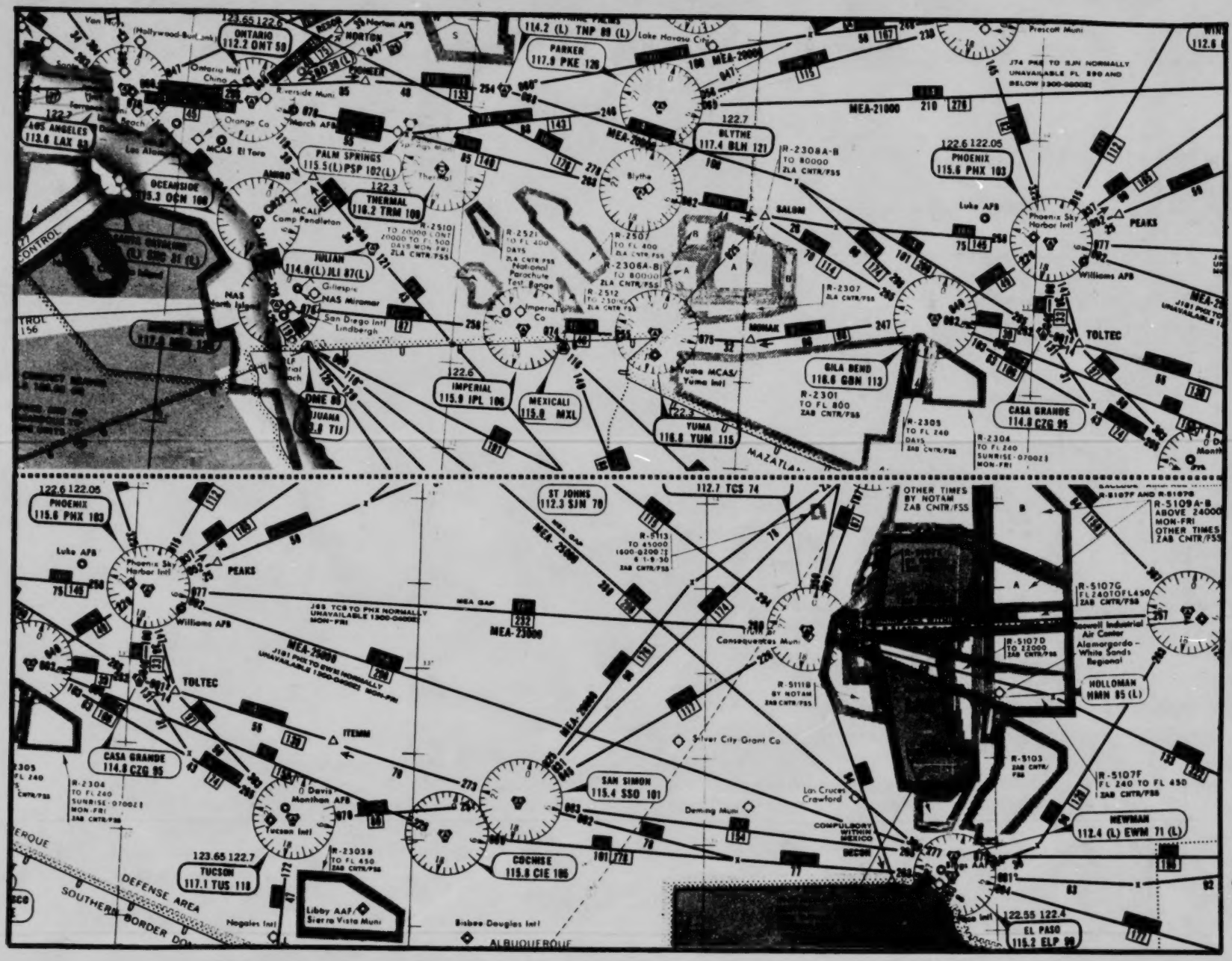

ONTARIO
112.2 ONT 50
LOS ANGELES
113.6 LAX 53
OCEANSIDE
115.3 OCN 106
PALM SPRINGS
115.5 (L) PSP 102 (L)
THERMAL
116.2 TRM 109
JULIAN
114.8 (L) JLI 87 (L)
IMPERIAL
115.9 IPL 106
MEXICALI
115.9 MXL
PARKER
117.9 PKE 126
BLYTHE
117.4 BLH 121
PHOENIX
115.6 PHX 103
GILA BEND
118.6 GBN 113
YUMA
116.8 YUM 115
CASA GRANDE
114.8 CZG 95
ST JOHNS
112.3 SJN 70
SAN SIMON
115.4 SSO 101
COCHISE
115.8 CIE 105
TUCSON
117.1 TUS 118
HOLLOMAN
HMN 85 (L)
NEWMAN
112.4 (L) EWM 71 (L)
EL PASO
116.2 ELP 99
TOLTEC
PEAKS
MEA-21000
MEA-23000
MEA GAP
DEFENSE AREA
SOUTHERN BORDER
ALBUQUERQUE

Figure 54

FLIGHT TIME ANALYSIS

CHECK POINTS		ROUTE	MACH NO.	WIND FACTOR	SPEED-KNOTS		DIST N.M.	TIME		FUEL CONSUMPTION (POUNDS)	
FROM	TO	ALTITUDE FLT/LEVEL		TEMPERATURE	TAS	GRND SPEED		LEG	TOTAL	LEG	TOTAL
McCARRAN INTL.	BLD VORTAC	MEAD3.BLD CLIMB	--	--- ---	--	--	15	:03		----	----
BLD VORTAC	LEVEL OFF	MEAD3.PRC CLIMB	--	--- ---	--	--	95	:14		----	*5,800
LEVEL OFF	PRC VORTAC	MEAD3.PRC FL 330		+35 knots ISA +6°C.							
PRC VORTAC	PHX VORTAC	J11 FL 330		+35 knots ISA +6°C.							
PHX VORTAC	TOP OF DESCENT	J181 FL 330		+35 knots ISA +6°C.							
TOP OF DESCENT	EL PASO INTL.	--- DESCENT	&	--- APPROACH	Av. 278 knots		107			1,530	

OTHER DATA:

*INCLUDES 1,000 LBS. FUEL FOR TAXI ALLOWANCE.

NOTE: Use 9,770 PPH total fuel flow from level-off to top-of-descent.

Use 8,050 PPH total fuel flow for reserve requirement.

FLIGHT SUMMARY

TIME	FUEL	
		ENROUTE
		RESERVE
---	1,200	MISSED APPROACH
		TOTAL

Figure 55

Questions 697, 698, 699, and 700 refer to a flight from McCarran International Airport, Las Vegas, Nevada, to El Paso International Airport. Refer to the: (1) Flight Time Analysis, Fig. 55; (2) SID, Fig. 56, page 114; (3) Enroute High Altitude Chart excerpts, Fig. 56, page 114; and Fig. 57, page 115.

697. What is the ETE at .78 Mach?

X11
1- 1 hour 24 minutes
2- 1 hour 21 minutes
3- 1 hour 18 minutes
4- 1 hour 15 minutes

698. What is the total fuel required at .78 Mach?

X12
1- 22,500 pounds
2- 21,700 pounds
3- 20,800 pounds
4- 19,800 pounds

699. What is the specific range in nautical air miles per 1,000 pounds of fuel from level-off to the PHX VORTAC using .78 Mach?

X14
1- 50.7 NAM/1,000
2- 47.1 NAM/1,000
3- 46.6 NAM/1,000
4- 43.5 NAM/1,000

700. What approximate indicated Mach should be maintained to arrive over the PHX VORTAC 16 minutes after level-off?

X13
1- .77 Mach
2- .76 Mach
3- .75 Mach
4- .74 Mach

Questions 701, 702, 703, and 704 refer to a flight from McCarran International Airport, Las Vegas, Nevada, to El Paso International Airport. Refer to the: (1) Flight Time Analysis, Fig. 55; (2) SID, Fig. 56, page 114; (3) Enroute High Altitude Chart excerpts, Fig. 56, page 114; and Fig. 57, page 115.

701. What is the ETE at .80 Mach?

X11
1- 1 hour 21 minutes
2- 1 hour 18 minutes
3- 1 hour 15 minutes
4- 1 hour 13 minutes

702. What is the total fuel required at .80 Mach?

X12
1- 21,800 pounds
2- 20,700 pounds
3- 19,500 pounds
4- 18,600 pounds

703. What is the specific range in nautical air miles per 1,000 pounds of fuel from level-off to top-of-descent using .80 Mach?

X14
1- 44.5 NAM/1,000
2- 48.1 NAM/1,000
3- 49.9 NAM/1,000
4- 51.8 NAM/1,000

704. What approximate indicated Mach should be maintained to arrive at top-of-descent point 39 minutes after level-off?

X13
1- .79 Mach
2- .77 Mach
3- .75 Mach
4- .73 Mach

Questions 705, 706, 707, and 708 refer to a flight from McCarran International Airport, Las Vegas, Nevada, to El Paso International Airport. Refer to the: (1) Flight Time Analysis, Fig. 52; (2) SID, Fig. 56, page 114; (3) Enroute High Altitude Chart excerpts, Fig. 56, page 114; and Fig. 57, page 115.

705. What is the ETE at .82 Mach?

X11
1- 1 hour 24 minutes
2- 1 hour 22 minutes
3- 1 hour 20 minutes
4- 1 hour 17 minutes

706. What is the total fuel required at .82 Mach?

X12
1- 23,400 pounds
2- 22,500 pounds
3- 21,600 pounds
4- 20,500 pounds

707. What is the specific range in nautical air miles per 1,000 pounds of fuel between the PRC VORTAC and top-of-descent point using .82 Mach?

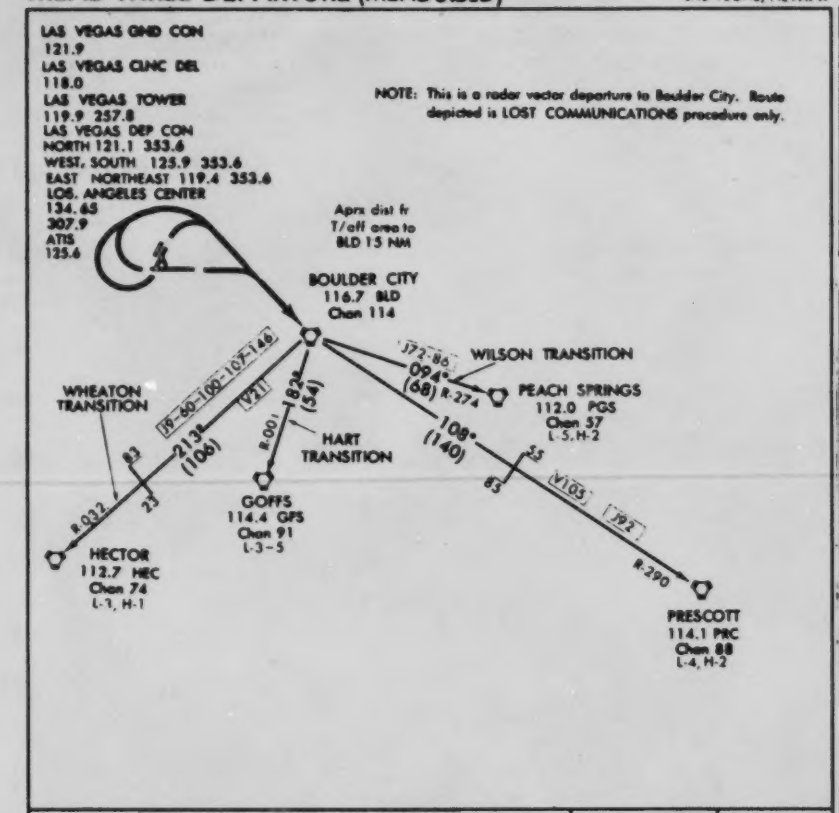
X14
1- 53.2 NAM/1,000
2- 51.4 NAM/1,000
3- 49.5 NAM/1,000
4- 47.6 NAM/1,000

708. What approximate indicated Mach should be maintained to arrive over the PHX VORTAC 16 minutes after level-off?

X13
1- .74 Mach
2- .75 Mach
3- .76 Mach
4- .77 Mach

MEAD THREE DEPARTURE (MEAD3.BLD)

MC CARRAN INTL
LAS VEGAS, NEVADA



DEPARTURE ROUTE DESCRIPTION

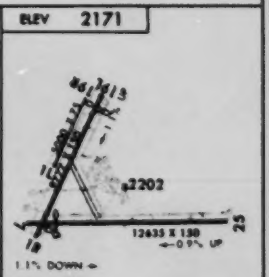
Take-off Runways 1, 7, 19 and 25: Climb via runway heading for vector to BOULDER CITY VORTAC. Then via (transition) or (assigned route).

LOST COMMUNICATIONS: If not in contact with Departure Control one minute after take-off:

Take-off Runways 1, 19 and 25: Turn right proceed direct BOULDER CITY VORTAC.

Take-off Runway 7: Climb straight ahead to 3400' MSL, continue climb turn right proceed direct to BOULDER CITY VORTAC.

(Continued on next page)



MEAD THREE DEPARTURE (MEAD3.BLD)

LAS VEGAS, NEVADA
MC CARRAN INTL

(Continued)

HART TRANSITION (MEAD3.GFS): Via BOULDER CITY R-182 and GOFFS R-001 to GOFFS VORTAC. Minimum enroute altitude 8000' MSL.

PRESCOTT TRANSITION (MEAD3.PRC): Via BOULDER CITY R 108 and PRESCOTT R-290 to PRESCOTT VORTAC.

WHEATON TRANSITION (MEAD3.HEC): Via BOULDER CITY R-213 and HECTOR R-032 to HECTOR VORTAC.

WILSON TRANSITION (MEAD3.PGS): Via BOULDER CITY R-094 and PEACH SPRINGS R-274 to PEACH SPRINGS VORTAC.

MEAD THREE DEPARTURE (MEAD3.BLD)

LAS VEGAS, NEVADA
McCARRAN INTL

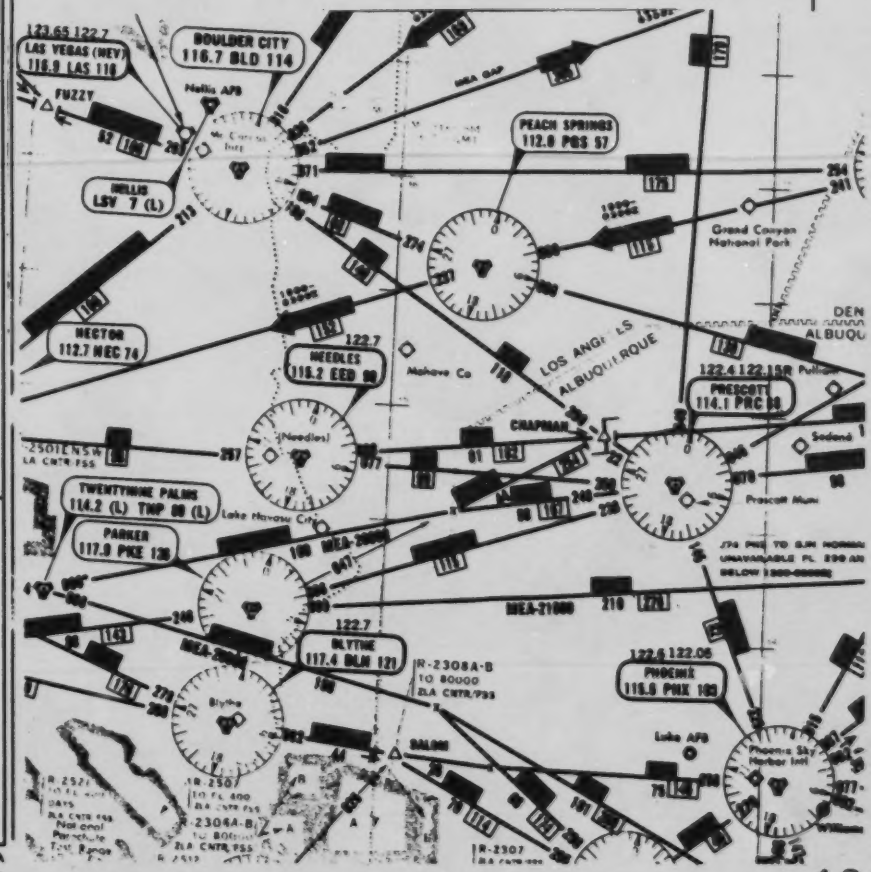


Figure 56

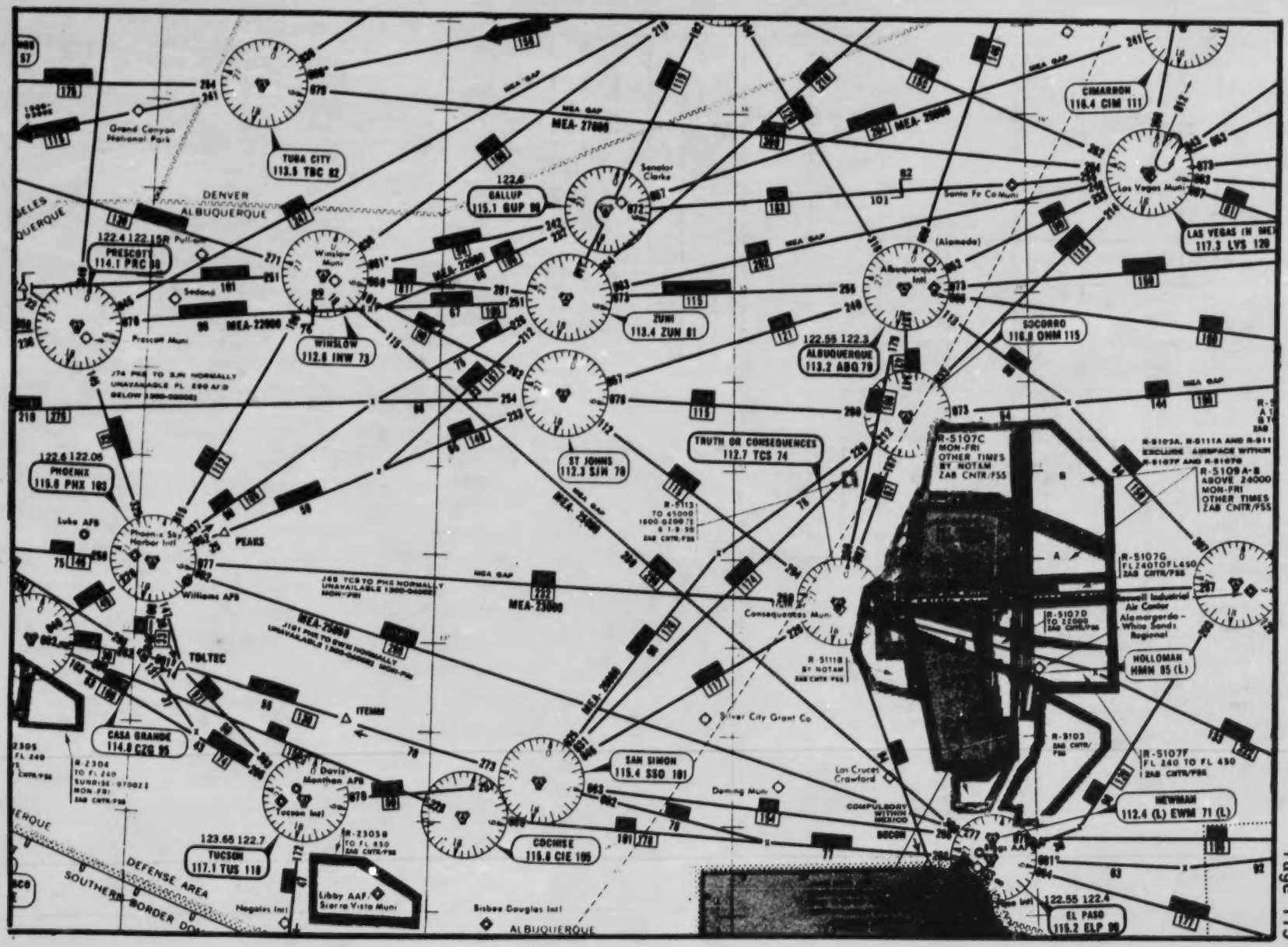

TUBA CITY
113.6 TBC 82
GALLUP
115.1 GUP 86
PRESCOTT
114.1 PRC 36
WINSLOW
112.6 INW 73
ZUNI
113.4 ZUN 81
ST JOHNS
112.3 SJN 78
TRUTH OR CONSEQUENCES
112.7 TCS 74
ALBUQUERQUE
113.2 ABQ 79
SOCORRO
116.8 ONM 115
CINNARON
116.4 CIM 111
LAS VEGAS
117.3 LVS 120
PHOENIX
115.6 PHX 103
PEAKS
TOLTEC
CASA GRANDE
114.8 CZG 95
SAN SIMON
115.4 SSO 101
COCHISE
116.6 CIE 105
TUCSON
117.1 TUS 118
HOLLOMAN
HMN 85 (L)
NEWMAN
112.4 (L) EWM 71 (L)
EL PASO
116.2 ELP 96
MEA-27000
MEA-23000
MEA-22000
MEA GAP
DENVER
ALBUQUERQUE
DEFENSE AREA
SOUTHERN BORDER
R-5107C
R-5107G
R-5107D
R-5107F
R-5109A-B
R-5103
R-2304
R-2303B
R-5113
R-5111B
Grand Canyon National Park
Prescott Muni
Winslow Muni
Sedona
Senator Clarke
Santa Fe Co Muni
Las Vegas Muni
Albuquerque Intl
(Alameda)
Phoenix Sky Harbor Intl
Luke AFB
Williams AFB
Consequentes Muni
Roswell Industrial Air Center
Alamogordo - White Sands Regional
Silver City Grant Co
Las Cruces Crawford
Deming Muni
Davis Monthan AFB
Tucson Intl
Libby AAF
Sierra Vista Muni
Nogales Intl
Bisbee Douglas Intl
ALBUQUERQUE

Figure 57

FLIGHT TIME ANALYSIS

CHECK POINTS		ROUTE	MACH NO.	WIND FACTOR	SPEED-KNOTS		DIST	TIME		FUEL CONSUMPTION (POUNDS)	
FROM	TO	ALTITUDE FLT/LEVEL		TEMPERATURE	TAS	GRND SPEED	N.M.	LEG	TOTAL	LEG	TOTAL
PHOENIX SKY HARBOR INTL.	LEVEL OFF	41M6.TNP CLIMB	---	----- -----	--	--	82	--	:15	---	*5,500
LEVEL OFF	CUNNINGHAM INT.	41M6.TNP FL 310		-30 knots ISA -3°C.							
CUNNINGHAM INT.	TNP VORTAC	41M6.TNP FL 310		-30 knots ISA -3°C.							
TNP VORTAC	CIVET INT.	TNP CIVET 1 FL 310		-30 knots ISA -3°C.							
CIVET INT.	LOS ANGELES INTL.	RADAR/ILS DESCENT	&	----- APPROACH	--	--	---	:12		1,500	

OTHER DATA:

*INCLUDES 1,000 LBS. FUEL FOR TAXI ALLOWANCE.

NOTE: Use mileage for RWY 8 DEPARTURE to determine level-off point.

Use 10,500 PPH total fuel flow from level-off to the CIVET Intersection.

Use 9,300 PPH total fuel flow for reserve requirement.

FLIGHT SUMMARY

TIME	FUEL	
		ENROUTE
		RESERVE
--	1,500	MISSED APPROACH
		TOTAL

Figure 58

Questions 709, 710, 711, and 712 refer to a flight from Phoenix Sky Harbor International Airport to Los Angeles International Airport. Refer to the: (1) Flight Time Analysis, Fig. 58; (2) SID, Fig. 59, page 118; and (3) STAR, Fig. 60, page 119.

709. What is the ETE at .78 Mach?

X11
1- 59 minutes
2- 57 minutes
3- 55 minutes
4- 53 minutes

710. What is the total fuel requirement at .78 Mach?

X12
1- 21,700 pounds
2- 20,800 pounds
3- 19,100 pounds
4- 18,000 pounds

711. What is the specific range in nautical air miles per 1,000 pounds of fuel from level-off to the TNP VORTAC using .78 Mach?

X14
1- 45.0 NAM/1,000
2- 43.2 NAM/1,000
3- 42.0 NAM/1,000
4- 40.2 NAM/1,000

712. What approximate indicated Mach should be maintained to arrive at the CIVET Intersection 29 minutes after level-off?

X13
1- .85 Mach
2- .83 Mach
3- .82 Mach
4- .81 Mach

Questions 713, 714, 715, and 716 refer to a flight from Phoenix Sky Harbor International Airport to Los Angeles International Airport. Refer to the: (1) Flight Time Analysis, Fig. 58; (2) SID, Fig. 59, page 118; and (3) STAR, Fig. 60, page 119.

713. What is the ETE at .80 Mach?

X11
1- 1 hour 02 minutes
2- 59 minutes
3- 57 minutes
4- 55 minutes

714. What is the total fuel required at .80 Mach?

X12
1- 22,500 pounds
2- 21,700 pounds
3- 20,600 pounds
4- 19,500 pounds

715. What is the specific range in nautical air miles per 1,000 pounds of fuel from level-off to the CIVET Intersection using .80 Mach?
X14

1- 41.5 NAM/1,000
2- 43.4 NAM/1,000
3- 44.4 NAM/1,000
4- 46.4 NAM/1,000

716. What approximate indicated Mach should be maintained to arrive over the TNP VORTAC 21 minutes after level-off?
X13

1- .75 Mach
2- .74 Mach
3- .73 Mach
4- .72 Mach

Questions 717, 718, 719, and 720 refer to a flight from Phoenix Sky Harbor International Airport to Los Angeles International Airport. Refer to the: (1) Flight Time Analysis, Fig. 58; (2) SID, Fig. 59, page 118; and (3) STAR, Fig. 60, page 119.

717. What is the ETE at .82 Mach?

X11
1- 58 minutes
2- 56 minutes
3- 54 minutes
4- 52 minutes

718. What is the total fuel required at .82 Mach?

X12
1- 21,800 pounds
2- 20,500 pounds
3- 19,600 pounds
4- 18,800 pounds

719. What is the specific range in nautical air miles per 1,000 pounds of fuel from CUNNINGHAM Intersection to the CIVET Intersection using .82 Mach?
X14

1- 47.3 NAM/1,000
2- 45.3 NAM/1,000
3- 44.4 NAM/1,000
4- 42.5 NAM/1,000

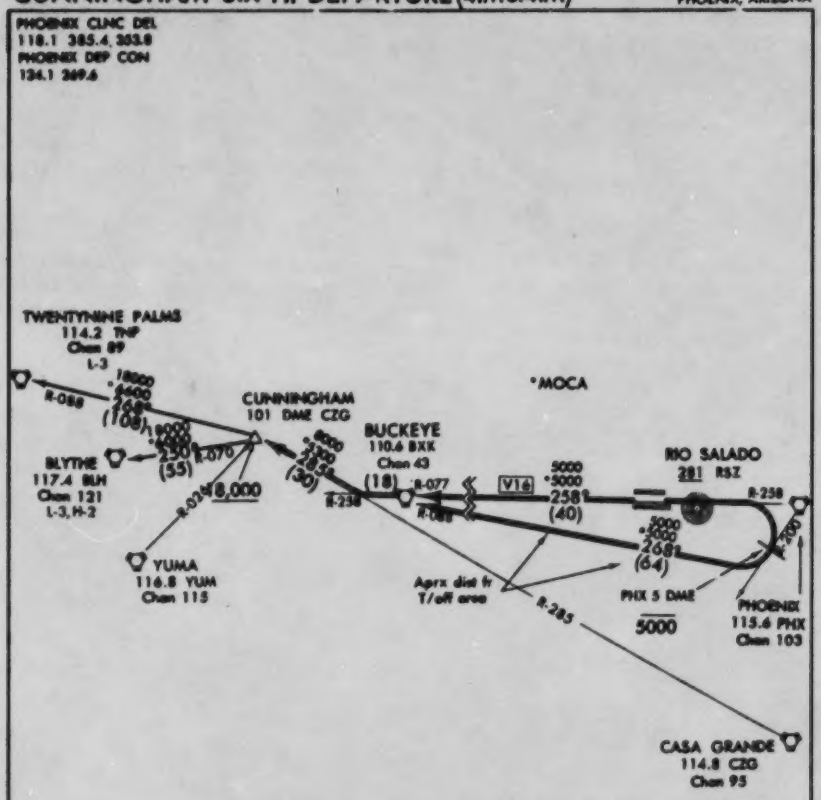
720. What approximate indicated Mach should be maintained to arrive over the CIVET Intersection 26 minutes after passing CUNNINGHAM Intersection?
X13

1- .81 Mach
2- .80 Mach
3- .79 Mach
4- .77 Mach

PHOENIX SKY HARBOR INTL

CUNNINGHAM SIX HI DEPARTURE (41M6.41M)

PHOENIX, ARIZONA



ELEV 1128

DEPARTURE ROUTE DESCRIPTION

Take-off Runways 8L/R: Climb direct to RSZ NDB. After station passage turn right, intercept PHX R-200 then via R-200 and BXK R-088 to BUCKEYE VORTAC. Cross PHX R-200/5 DME at or below 5000'. Thence. . . .

Take-off Runways 26L/R: Maintain runway heading until leaving 2500' then intercept PHX R-258 and proceed via PHX R-258 and BXK R-077 to BUCKEYE VORTAC. Thence. . . .

(Continued on next page)

CUNNINGHAM SIX HI DEPARTURE (41M6.41M)

PHOENIX, ARIZONA

PHOENIX SKY HARBOR INTL

CUNNINGHAM SIX HI DEPARTURE (41M6.41M)

DEPARTURE ROUTE DESCRIPTION

(continued)

. . . . Via BXK R-258 and CZG R-285 to CUNNINGHAM INT/DME, then via (transition) or (assigned route). Expect further clearance to filed altitude at BXK VORTAC. Departure control frequency 124.1.

BLYTHE TRANSITION (41M6.BLH): Via BLH R-070 to BLH VORTAC.

TWENTYNINE PALMS TRANSITION (41M6.TNP): Via TNP R-088 to TNP VORTAC.

CUNNINGHAM SIX HI DEPARTURE (41M6.41M)

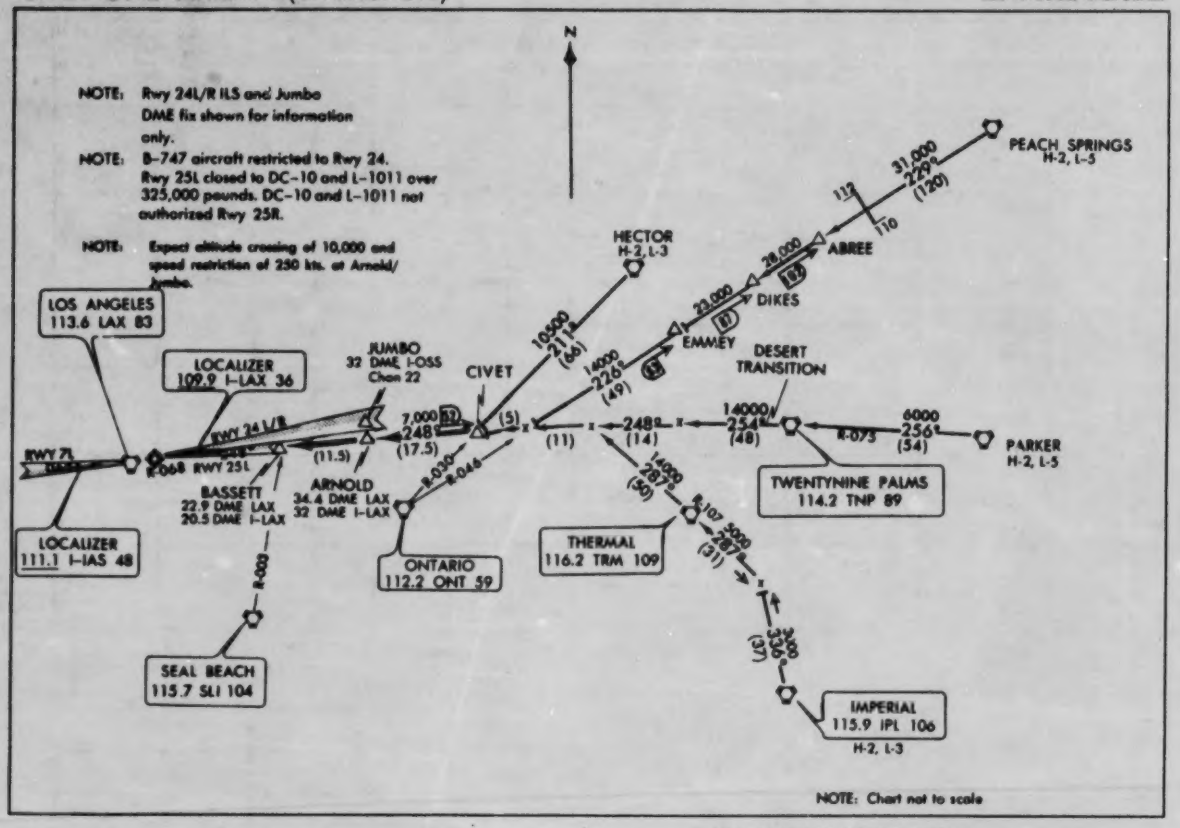
PHOENIX, ARIZONA

PHOENIX SKY HARBOR INTL

Figure 59

CIVET ONE ARRIVAL (CIVET.CIVET1)

LOS ANGELES INTERNATIONAL
LOS ANGELES, CALIFORNIA


N
NOTE: Rwy 24L/R ILS and Jumbo DME fix shown for information only.
NOTE: B-747 aircraft restricted to Rwy 24. Rwy 25L closed to DC-10 and L-1011 over 325,000 pounds. DC-10 and L-1011 not authorized Rwy 25R.
NOTE: Expect altitude crossing of 10,000 and speed restriction of 250 kts. at Arnold/Jumbo.
LOS ANGELES 113.6 LAX 83
LOCALIZER 109.9 I-LAX 36
JUMBO 32 DME I-OSS Chan 22
CIVET
HECTOR H-2, L-3
PEACH SPRINGS H-2, L-5
ABREE
DIKES
EMMEY
DESERT TRANSITION
PARKER H-2, L-5
TWENTYNINE PALMS 114.2 TNP 89
THERMAL 116.2 TRM 109
IMPERIAL 115.9 IPL 106 H-2, L-3
ONTARIO 112.2 ONT 59
ARNOLD 34.4 DME LAX 32 DME I-LAX
BASSETT 22.9 DME LAX 20.5 DME I-LAX
SEAL BEACH 115.7 SLI 104
LOCALIZER 111.1 I-IAS 48
RWY 24 L/R
RWY 25L
RWY 7L
R-068
R-030
R-046
R-107
R-075
NOTE: Chart not to scale

CIVET ONE ARRIVAL (CIVET.CIVET1)

LOS ANGELES INTERNATIONAL
LOS ANGELES, CALIFORNIA

ARRIVAL ROUTE DESCRIPTION

DESERT TRANSTION (TNP.CIVET1): From over TWENTYNINE PALMS VORTAC via TWENTYNINE PALMS R-254 and LOS ANGELES R-068 to CIVET INT. Thence . . . .

HECTOR TRANSITION (HEC.CIVET1): From over HECTOR VORTAC via HECTOR R-211 and ONTARIO R-030 to CIVET INT. Thence . . . .

IMPERIAL TRANSITION (IPL.CIVET1): From over IMPERIAL VORTAC via IMPERIAL R-336 and THERMAL R-107 and R-287 and LOS ANGELES R-068 to CIVET INT. Thence . . . .

PARKER TRANSITION (PKE.CIVET1): From over PARKER VORTAC via PARKER R-256 and TWENTYNINE PALMS R-075 to TWENTYNINE PALMS VORTAC. Via TWENTYNINE PALMS R-254 and LOS ANGELES R-068 to CIVET INT. Thence . . . .

PEACH SPRINGS TRANSITION (PGS.CIVET1): From over PEACH SPRINGS VORTAC via PEACH SPRINGS R-229 and ONTARIO R-046 and LOS ANGELES R-068 to CIVET INT. Thence . . . .

. . . . From CIVET INT. via LOS ANGELES ILS Rwy 25L Localizer east course/LAX R-068 via ARNOLD DME Fix to BASSETT INT. Expect ILS approach from Bassett Int, expect altitude crossing of 10,000' and speed restriction of 250 kts. at Arnold/Jumbo.

CIVET ONE ARRIVAL (CIVET.CIVET1)

LOS ANGELES, CALIFORNIA
LOS ANGELES INTERNATIONAL

Figure 60

FLIGHT TIME ANALYSIS

CHECK POINTS		ROUTE	MACH NO.	WIND FACTOR	SPEED-KNOTS		DIST	TIME		FUEL CONSUMPTION (POUNDS)	
FROM	TO	ALTITUDE FLT/LEVEL		TEMPERATURE	TAS	GRND SPEED	N.M.	LEG	TOTAL	LEG	TOTAL
LOS ANGELES INTL.	SLI VORTAC	OCEN2. SLI CLIMB	--	----- -----	--	--	48	--	--	---	---
SLI VORTAC	LEVEL OFF	OCEN2. PKE CLIMB	--	----- -----	--	--	32	--	:22	---	*6,600
LEVEL OFF	PKE VORTAC	OCEN2. PKE FL 330		+27 knots ISA +9°C.							
PKE VORTAC	PRC VORTAC	J78 FL 330		+27 knots ISA +9°C.							
PRC VORTAC	ABQ VORTAC	J6-78 FL 330		+27 knots ISA +9°C.							
ABQ VORTAC	ABQ INTL. AIRPORT	-- DESCENT	& &	----- APPROACH	--	--	---	:12		1,200	

OTHER DATA:

*INCLUDES 1,000 LBS. TAXI FUEL ALLOWANCE.

NOTE: Use 9,850 PPH total fuel flow from level-off to the ABQ VORTAC.

Use 8,850 PPH total fuel flow for reserve requirements.

FLIGHT SUMMARY

TIME	FUEL	
		ENROUTE
		RESERVE
---	1,200	MISSED APPROACH
		TOTAL

Figure 61

Questions 721, 722, 723, and 724 refer to a flight from Los Angeles International Airport to Albuquerque International Airport. Refer to the: (1) Flight Time Analysis, Fig. 61; (2) SID, Fig. 62, page 122; and (3) Enroute High Altitude Chart excerpts, Fig. 63, page 123.

721. What is the ETE at .78 Mach?

X11
1- 1 hour 40 minutes
2- 1 hour 36 minutes
3- 1 hour 33 minutes
4- 1 hour 30 minutes

722. What is the total fuel required at .78 Mach?

X12
1- 26,500 pounds
2- 25,400 pounds
3- 24,200 pounds
4- 22,600 pounds

723. What is the specific range in nautical air miles per 1,000 pounds of fuel from level-off to the PKE VORTAC using .78 Mach?

X14
1- 49.7 NAM/1,000
2- 48.8 NAM/1,000
3- 47.8 NAM/1,000
4- 46.9 NAM/1,000

724. What approximate indicated Mach should be maintained to arrive over the PRC VORTAC 30 minutes after level-off?

X13
1- .84 Mach
2- .83 Mach
3- .81 Mach
4- .80 Mach

Questions 725, 726, 727, and 728 refer to a flight from Los Angeles International Airport to Albuquerque International Airport. Refer to the: (1) Flight Time Analysis, Fig. 61; (2) SID, Fig. 62, page 122; and (3) Enroute High Altitude Chart excerpts, Fig. 63, page 123.

725. What is the ETE at .80 Mach?

X11
1- 1 hour 42 minutes
2- 1 hour 40 minutes
3- 1 hour 38 minutes
4- 1 hour 35 minutes

726. What is the total fuel required at .80 Mach?

X12
1- 28,500 pounds
2- 27,800 pounds
3- 26,200 pounds
4- 23,500 pounds

727. What is the specific range in nautical air miles per 1,000 pounds of fuel from
X14 level-off to the PRC VORTAC using .80 Mach?

1- 50.6 NAM/1,000
2- 49.7 NAM/1,000
3- 48.6 NAM/1,000
4- 47.8 NAM/1,000

728. What approximate indicated Mach should be maintained to arrive over the ABQ
X13 VORTAC 1 hour and 05 minutes after level-off?

1- .83 Mach
2- .82 Mach
3- .81 Mach
4- .79 Mach

Questions 729, 730, 731, and 732 refer to a flight from Los Angeles International Airport to Albuquerque International Airport. Refer to the: (1) Flight Time Analysis, Fig. 61; (2) SID, Fig. 62, page 122; and (3) Enroute High Altitude Chart excerpts, Fig. 63, page 123.

729. What is the ETE at .82 Mach?

X11
1- 1 hour 40 minutes
2- 1 hour 37 minutes
3- 1 hour 35 minutes
4- 1 hour 32 minutes

730. What is the total fuel required at .82 Mach?

X12
1- 26,900 pounds
2- 26,000 pounds
3- 24,900 pounds
4- 23,800 pounds

731. What is the specific range in nautical air miles per 1,000 pounds of fuel from
X14 the PRC VORTAC to the ABQ VORTAC using .82 Mach?

1- 52.0 NAM/1,000
2- 51.3 NAM/1,000
3- 49.3 NAM/1,000
4- 48.4 NAM/1,000

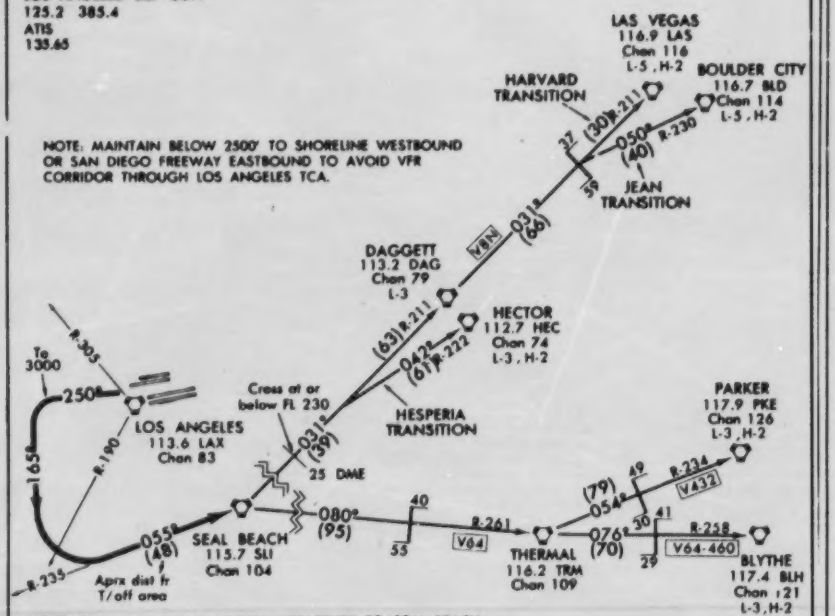
732. What approximate indicated Mach should be maintained to arrive over the ABQ
X13 VORTAC 44 minutes after passing the PKE VORTAC?

1- .86 Mach
2- .85 Mach
3- .84 Mach
4- .83 Mach

LOS ANGELES GND CON
121.65(N)121.75 (S) 327.0
LOS ANGELES CLNC DEL
121.4
LOS ANGELES TOWER
S 118.9 379.1
N 120.8 239.3
LOS ANGELES DEP CON
125.2 385.4
ATIS
133.65

NOISE ABATEMENT SID TO BE USED IN LIEU OF DAGGETT, HECTOR AND SEAL BEACH SIDS DURING THE PERIOD 2100-0700 LOCAL TIME.

NOTE: MAINTAIN BELOW 2500' TO SHORELINE WESTBOUND OR SAN DIEGO FREEWAY EASTBOUND TO AVOID VFR CORRIDOR THROUGH LOS ANGELES TCA.

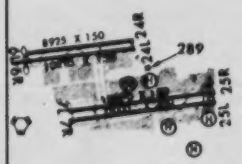


NOTE: THIS IS A RADAR VECTOR DEPARTURE TO SEAL BEACH.
ROUTE DEPICTED IS A LOST COMMUNICATION PROCEDURE ONLY.

DEPARTURE ROUTE DESCRIPTION

Take-off Runways 25L, 25R and 24L: Climb via heading 250° for off-shore vector to SEAL BEACH VORTAC. Then via (transition) or (assigned route). Departure Control freq. will be 125.2. Aircraft filing FL 240 or above expect further clearance to filed flight level ten minutes after departure. LOST COMMUNICATIONS: If not in contact with departure control one minute after crossing the shoreline or the LOS ANGELES VORTAC 190 or 305 radials continue heading 250° to 3000', then turn left heading 165°. Continue climb to intercept and proceed via SEAL BEACH VORTAC R-235 to SEAL BEACH VORTAC. (Continued on next page)

ELEV 126



DEPARTURE ROUTE DESCRIPTION
(Continued)

BLYTHE TRANSITION (OCEN2.BLH): Via SEAL BEACH VORTAC R-080 and THERMAL R-261 to THERMAL VORTAC. Then via THERMAL VORTAC R-076 and BLYTHE VORTAC R-258 to BLYTHE VORTAC.

DAGGETT TRANSITION (OCEN2.DAG): Via SEAL BEACH VORTAC R-031 and DAGGETT VORTAC R-211 to DAGGETT VORTAC. Cross SEAL BEACH VORTAC R-031/25 DME fix at or below FL 230.

HARVARD TRANSITION (OCEN2.LAS): Via SEAL BEACH VORTAC R-031 and DAGGETT VORTAC R-211 to DAGGETT VORTAC. Then via DAGGETT VORTAC R-031 and LAS VEGAS VORTAC R-211 to LAS VEGAS VORTAC. Cross SEAL BEACH VORTAC R-031/25 DME fix at or below FL 230.

HESPERIA TRANSITION (OCEN2.HEC): Via SEAL BEACH VORTAC R-031 and HECTOR VORTAC R-222 to HECTOR VORTAC. Cross SEAL BEACH VORTAC R-031/25 DME fix at or below FL 230.

JEAN TRANSITION (OCEN2.BLD): Via SEAL BEACH VORTAC R-031 and DAGGETT VORTAC R-211 to DAGGETT VORTAC. Then via DAGGETT VORTAC R-031 and BOULDER CITY VORTAC R-230 to BOULDER CITY. Cross SEAL BEACH VORTAC R-031/25 DME fix at or below FL 230.

PARKER TRANSITION (OCEN2.PKE): Via SEAL BEACH VORTAC R-080 and THERMAL VORTAC R-261 to THERMAL VORTAC. Then via THERMAL R-054 and PARKER VORTAC R-234 to PARKER VORTAC.

Figure 62

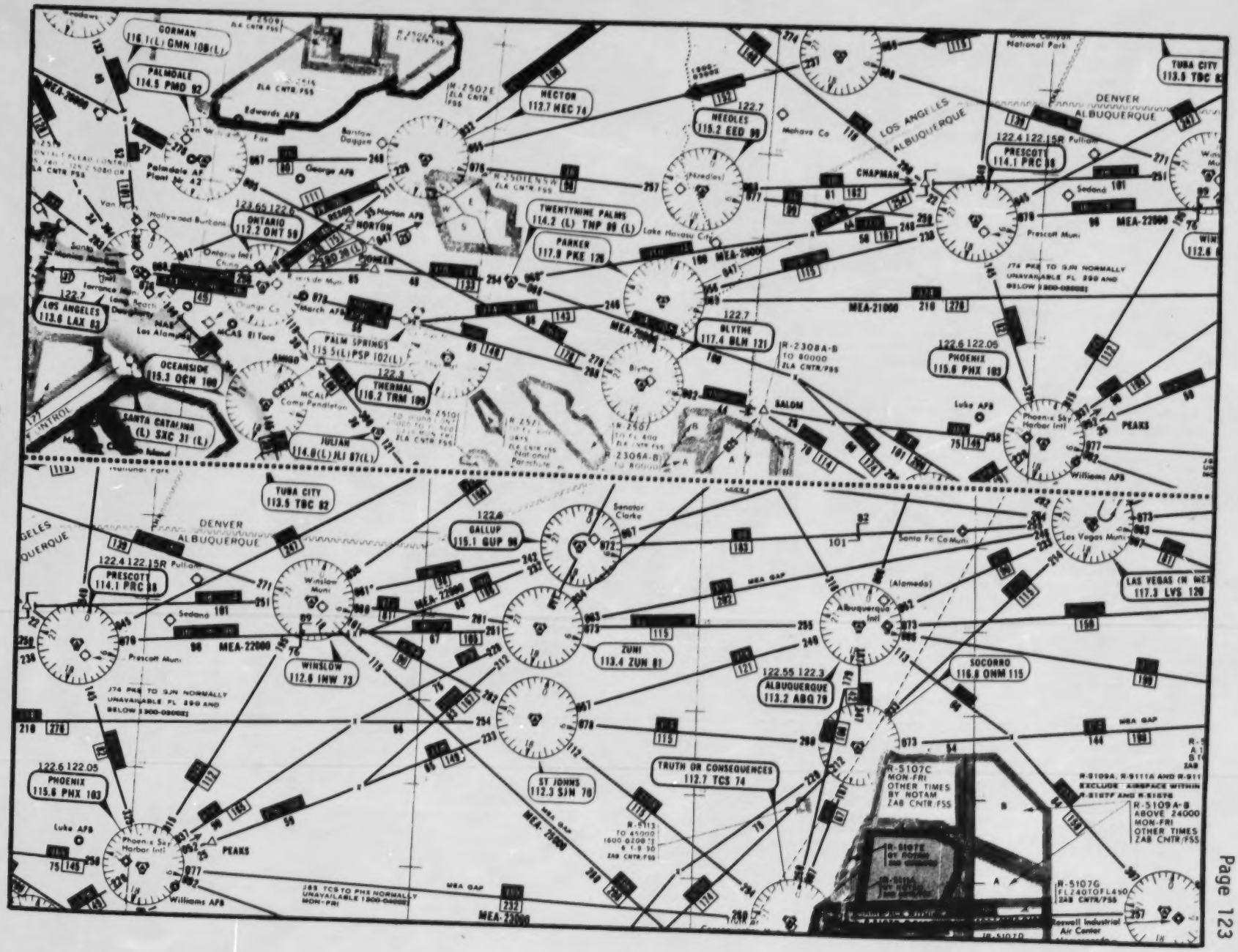

GORMAN
116.1 (L) GMN 108 (L)
PALMDALE
114.5 PMD 92
HECTOR
112.7 HEC 74
NEEDLES
115.2 EED 99
TUBA CITY
113.5 TBC
DENVER
ALBUQUERQUE
LOS ANGELES
ALBUQUERQUE
PRESCOTT
114.1 PRC 98
CHAPMAN
ONTARIO
112.2 ONT 58
TWENTYNINE PALMS
114.2 (L) TNP 89 (L)
PARKER
117.9 PKE 126
MEA-29000
MEA-22000
MEA-21000
LOS ANGELES
113.6 LAX 83
BLYTHE
117.4 BLH 121
PALM SPRINGS
115.5 (L) PSP 102 (L)
THERMAL
116.2 TRM 109
OCEANSIDE
115.3 OCN 108
SANTA CATALINA
(L) SXC 31 (L)
JULIAN
114.0 (L) JLI 87 (L)
PHOENIX
115.6 PHX 103
SALOM
PEAKS
Luke AFB
Williams AFB
GALLUP
115.1 GUP 96
ZUNI
113.4 ZUN 81
WINSLOW
112.6 INW 73
ALBUQUERQUE
113.2 ABQ 79
SOCORRO
116.8 ONM 115
LAS VEGAS
117.3 LVS 120
ST JOHNS
112.3 SJN 70
TRUTH OR CONSEQUENCES
112.7 TCS 74
R-5107C
MON-FRI
OTHER TIMES
BY NOTAM
ZAB CNTR/FSS
R-5109A-B
ABOVE 24000
MON-FRI
OTHER TIMES
ZAB CNTR/FSS
R-5107G
FL240TOFL490
ZAB CNTR/FSS
MEA GAP
MEA-23000

Figure 63

FLIGHT TIME ANALYSIS

CHECK POINTS		ROUTE	MACH NO.	WIND FACTOR	SPEED-KNOTS		DIST N.M.	TIME		FUEL CONSUMPTION (POUNDS)	
FROM	TO	ALTITUDE FLT/LEVEL		TEMPERATURE	TAS	GRND SPEED		LEG	TOTAL	LEG	TOTAL
PHOENIX SKY HARBOR INTL.	LEVEL OFF	41M6. TNP CLIMB	--	----- -----	--	--	109	--	:18	---	*5,900
LEVEL OFF	TNP VORTAC	41M6. TNP FL 350		-35 knots ISA +5°C.							
TNP VORTAC	DOWNEY INT.	TNP DOWNEY 2 FL 350		-35 knots ISA +5°C.							
DOWNEY INT.	WESTLAKE INT.	RADAR DESCENT	--	----- -----	--	--	---	--	--	---	----
WESTLAKE INT.	LOS ANGELES INTL.	RADAR DESCENT	& &	----- APPROACH	--	--	---	:15		2,500	

OTHER DATA:

*INCLUDES 1,000 LBS. FUEL FOR TAXI ALLOWANCE.

NOTE: Use mileage for RWY 26 DEPARTURE to determine level-off point.

Use 9,800 lbs./hr. total fuel flow from level-off to DOWNEY Intersection.

Use 8,700 lbs./hr. total fuel flow for reserve requirement.

FLIGHT SUMMARY

TIME	FUEL	
		ENROUTE
		RESERVE
----	1,000	MISSED APPROACH
		TOTAL

Figure 64

Questions 733, 734, 735, and 736 refer to a flight from Phoenix Sky Harbor International Airport to Los Angeles International Airport. Refer to the: (1) Flight Time Analysis, Fig. 64; (2) SID, Fig. 65, page 126; and (3) STAR, Fig. 66, page 127.

733. What is the ETE at .78 Mach?

X11
1- 1 hour 07 minutes
2- 1 hour 05 minutes
3- 1 hour 02 minutes
4- 58 minutes

734. What is the total fuel required at .78 Mach?

X12
1- 23,700 pounds
2- 22,800 pounds
3- 21,600 pounds
4- 20,700 pounds

735. What is the specific range in nautical air miles per 1,000 pounds of fuel from level-off to DOWNEY Intersection using .78 Mach?

X14
1- 46.2 NAM/1,000
2- 44.7 NAM/1,000
3- 42.6 NAM/1,000
4- 41.2 NAM/1,000

736. What approximate indicated Mach should be maintained to arrive over the DOWNEY Intersection 26 minutes after level-off?

X13
1- .87 Mach
2- .83 Mach
3- .82 Mach
4- .81 Mach

Questions 737, 738, 739, and 740 refer to a flight from Phoenix Sky Harbor International Airport to Los Angeles International Airport. Refer to the: (1) Flight Time Analysis, Fig. 64; (2) SID, Fig. 65, page 126; and (3) STAR, Fig. 66, page 127.

737. What is the ETE at .80 Mach?

X11
1- 1 hour 04 minutes
2- 1 hour 01 minute
3- 57 minutes
4- 55 minutes

738. What is the total fuel required at .80 Mach?

X12
1- 21,600 pounds
2- 20,600 pounds
3- 19,200 pounds
4- 18,000 pounds

739. What is the specific range in nautical air miles per 1,000 pounds of fuel from
X14 level-off to the TNP VORTAC using .80 Mach?

1- 42.8 NAM/1,000
2- 43.9 NAM/1,000
3- 46.4 NAM/1,000
4- 47.5 NAM/1,000

740. What approximate indicated Mach should be maintained to arrive over the TNP
X13 VORTAC 14 minutes after level-off?

1- .78 Mach
2- .76 Mach
3- .72 Mach
4- .70 Mach

Questions 741, 742, 743, and 744 refer to a flight from Phoenix Sky Harbor International Airport to Los Angeles International Airport. Refer to the: (1) Flight Time Analysis, Fig. 64; (2) SID, Fig. 65, page 126; and (3) STAR, Fig. 66, page 127.

741. What is the ETE at .82 Mach?

X11
1- 1 hour 05 minutes
2- 1 hour 03 minutes
3- 1 hour
4- 56 minutes

742. What is the total fuel required at .80 Mach?

X12
1- 22,400 pounds
2- 21,200 pounds
3- 20,500 pounds
4- 19,100 pounds

743. What is the specific range in nautical air miles per 1,000 pounds of fuel from
X14 the TNP VORTAC to DOWNEY Intersection using .82 Mach?

1- 48.6 NAM/1,000
2- 47.6 NAM/1,000
3- 45.1 NAM/1,000
4- 44.0 NAM/1,000

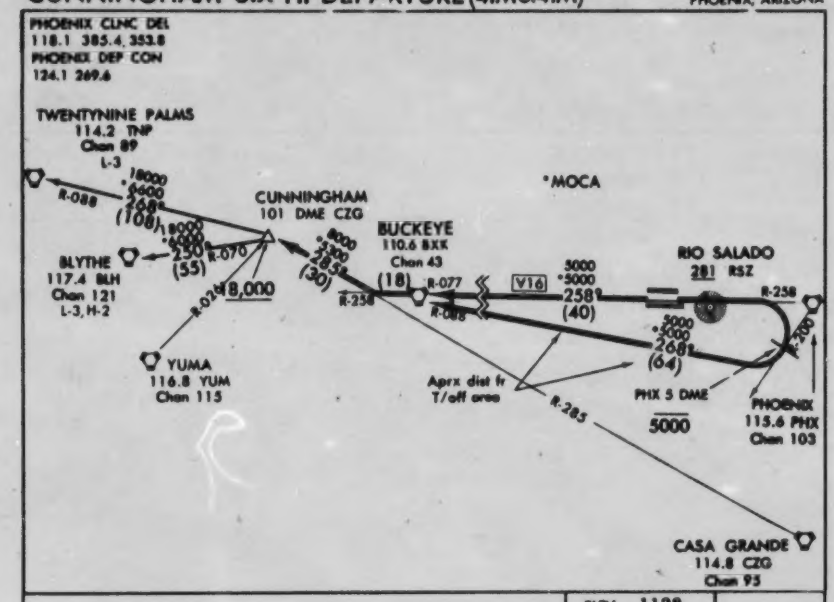
744. What approximate indicated Mach should be maintained to arrive over the DOWNEY
X13 Intersection 17 minutes after passing the TNP VORTAC?

1- .78 Mach
2- .77 Mach
3- .73 Mach
4- .71 Mach

PHOENIX SKY HARBOR INTL

CUNNINGHAM SIX HI DEPARTURE (4IM6.4IM)

PHOENIX, ARIZONA



ELEV 1128

DEPARTURE ROUTE DESCRIPTION

Take-off Runways 8L/R: Climb direct to RSZ NDB. After station passage turn right, intercept PHX R-200 then via R-200 and BXK R-088 to BUCKEYE VORTAC. Cross PHX R-200/5 DME at or below 5000'. Thence. . . .

Take-off Runways 26L/R: Maintain runway heading until leaving 2500' then intercept PHX R-258 and proceed via PHX R-258 and BXK R-077 to BUCKEYE VORTAC. Thence. . . .

(Continued on next page)

CUNNINGHAM SIX HI DEPARTURE (4IM6.4IM)

PHOENIX, ARIZONA

PHOENIX SKY HARBOR INTL

DEPARTURE ROUTE DESCRIPTION

(continued)

. . . . Via BXK R-258 and CZG R-285 to CUNNINGHAM INT/DME, then via (transition) or (assigned route). Expect further clearance to filed altitude at BXK VORTAC. Departure control frequency 124.1.

BLYTHE TRANSITION (4IM6.BLH): Via BLH R-070 to BLH VORTAC.

TWENTYNINE PALMS TRANSITION (4IM6.TNP): Via TNP R-088 to TNP VORTAC.

CUNNINGHAM SIX HI DEPARTURE (4IM6.4IM)

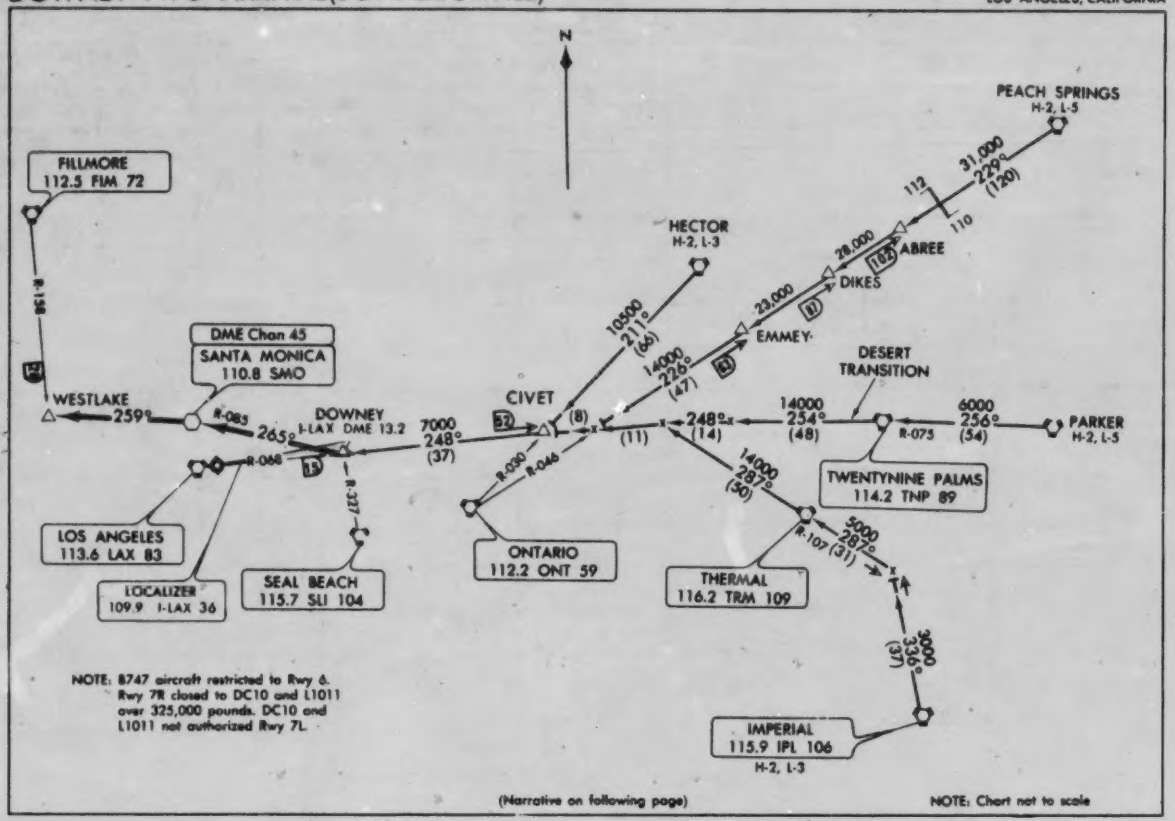
PHOENIX, ARIZONA

PHOENIX SKY HARBOR INTL

Figure 65

DOWNEY TWO ARRIVAL (DOWNE.DOWNE2)

LOS ANGELES INTERNATIONAL
LOS ANGELES, CALIFORNIA



ARRIVAL ROUTE DESCRIPTION

DESERT TRANSITION (TNP.DOWNE 2): From over TWENTYNINE PALMS VORTAC via TWENTYNINE PALMS R-254 and LOS ANGELES R-069 to DOWNEY INT. Thence . . . .

HECTOR TRANSITION (HEC.DOWNE 2): From over HECTOR VORTAC via HECTOR R-211 and ONTARIO R-030 and LOS ANGELES R-068 to DOWNEY INT. Thence . . . .

IMPERIAL TRANSITION (IPL.DOWNE 2): From over IMPERIAL VORTAC via IMPERIAL R-336 and THERMAL R-107 and R-287 and LOS ANGELES R-068 to DOWNEY INT. Thence . . . .

PARKER TRANSITION (PKE.DOWNE 2): From over PARKER VORTAC via PARKER R-256 and TWENTYNINE PALMS R-075 and R-254 and LOS ANGELES R-068 to DOWNEY INT. Thence . . . .

PEACH SPRINGS TRANSITION (PGS.DOWNE 2): From over PEACH SPRINGS VORTAC via PEACH SPRINGS R-229 and ONTARIO R-046 and LOS ANGELES R-068 to DOWNEY INT. Thence . . . .

. . . . From DOWNEY INT via SMO R-085 to SMO VOR, then via SMO R-259 to WESTLAKE INT, expect vector to final approach course.

DOWNEY TWO ARRIVAL (DOWNE.DOWNE 2) LOS ANGELES, CALIFORNIA
LOS ANGELES INTERNATIONAL

Figure 66

FLIGHT TIME ANALYSIS

CHECK POINTS		ROUTE	MACH NO.	WIND FACTOR	SPEED-KNOTS		DIST	TIME		FUEL CONSUMPTION (POUNDS)	
FROM	TO	ALTITUDE FLT/LEVEL		TEMPERATURE	TAS	GRND SPEED	N.M.	LEG	TOTAL	LEG	TOTAL
EL PASO INTL.	LEVEL OFF	J86 CLIMB	--	---- ----	--	--	84	--	:15	--	*5,500
LEVEL OFF	INW VORTAC	J310 FL 310		-25 knots ISA -3°C.							
INW VORTAC	PGS VORTAC	J72-86 FL 310		-25 knots ISA -3°C.							
PGS VORTAC	ELD VORTAC	J72-86 FL 310		-25 knots ISA -3°C.							
ELD VORTAC	McCARRAN INTL.	---- DESCENT	& &	---- APPROACH	--	--	--	:12		1,500	

OTHER DATA:

*INCLUDES 1,000 LBS. FUEL FOR TAXI ALLOWANCE.

NOTE: Use 10,500 PPH total fuel flow from level-off to the INW VORTAC.

Use 9,400 PPH total fuel flow for reserve requirement.

FLIGHT SUMMARY

TIME	FUEL	
		ENROUTE
		RESERVE
---	1,200	MISSED APPROACH
		TOTAL

Figure 67

Questions 745, 746, 747, and 748 refer to a flight from El Paso International Airport to McCarran International Airport, Las Vegas, Nevada. Refer to the: (1) Flight Time Analysis, Fig. 67; and (2) Enroute High Altitude Chart excerpts, Fig. 68, page 130.

745. What is the ETE at .78 Mach?

X11
1- 1 hour 24 minutes
2- 1 hour 26 minutes
3- 1 hour 28 minutes
4- 1 hour 30 minutes

746. What is the total fuel required at .78 Mach?

X12
1- 24,400 pounds
2- 25,500 pounds
3- 27,300 pounds
4- 28,000 pounds

747. What is the specific range in nautical air miles per 1,000 pounds of fuel from level-off to the INW VORTAC using .78 Mach?

X14
1- 39.8 NAM/1,000
2- 42.3 NAM/1,000
3- 43.2 NAM/1,000
4- 45.5 NAM/1,000

748. What approximate indicated Mach should be maintained to arrive over the INW VORTAC 32 minutes after level-off?

X13
1- .74 Mach
2- .75 Mach
3- .76 Mach
4- .78 Mach

Questions 749, 750, 751, and 752 refer to a flight from El Paso International Airport to McCarran International Airport, Las Vegas, Nevada. Refer to the: (1) Flight Time Analysis, Fig. 67; and (2) Enroute High Altitude Chart excerpts, Fig. 68, page 130.

749. What is the ETE at .80 Mach?

X11
1- 1 hour 25 minutes
2- 1 hour 28 minutes
3- 1 hour 30 minutes
4- 1 hour 32 minutes

750. What is the total fuel required at .80 Mach?

X12
1- 25,200 pounds
2- 26,800 pounds
3- 28,500 pounds
4- 29,800 pounds

751. What is the specific range in nautical air miles per 1,000 pounds of fuel from
X14 level-off to the PGS VORTAC using .80 Mach?

1- 41.6 NAM/1,000
2- 42.4 NAM/1,000
3- 44.3 NAM/1,000
4- 45.7 NAM/1,000

752. What approximate indicated Mach should be maintained to arrive over the PGS
X13 VORTAC 51 minutes after level-off?

1- .72 Mach
2- .74 Mach
3- .76 Mach
4- .78 Mach

Questions 753, 754, 755, and 756 refer to a flight from El Paso International Airport to McCarran International Airport, Las Vegas, Nevada. Refer to the: (1) Flight Time Analysis, Fig. 67; and (2) Enroute High Altitude Chart excerpts, Fig. 68, page 130.

753. What is the ETE at .82 Mach?

X11
1- 1 hour 23 minutes
2- 1 hour 25 minutes
3- 1 hour 27 minutes
4- 1 hour 29 minutes

754. What is the total fuel required at .82 Mach?

X12
1- 25,100 pounds
2- 26,900 pounds
3- 28,700 pounds
4- 29,900 pounds

755. What is the specific range in nautical air miles per 1,000 pounds of fuel from
X14 the INW VORTAC to the BLD VORTAC using .82 Mach?

1- 43.0 NAM/1,000
2- 44.1 NAM/1,000
3- 45.4 NAM/1,000
4- 46.7 NAM/1,000

756. What approximate indicated Mach should be maintained to arrive over the BLD
X13 VORTAC 27 minutes after passing the INW VORTAC?

1- .81 Mach
2- .82 Mach
3- .83 Mach
4- .84 Mach

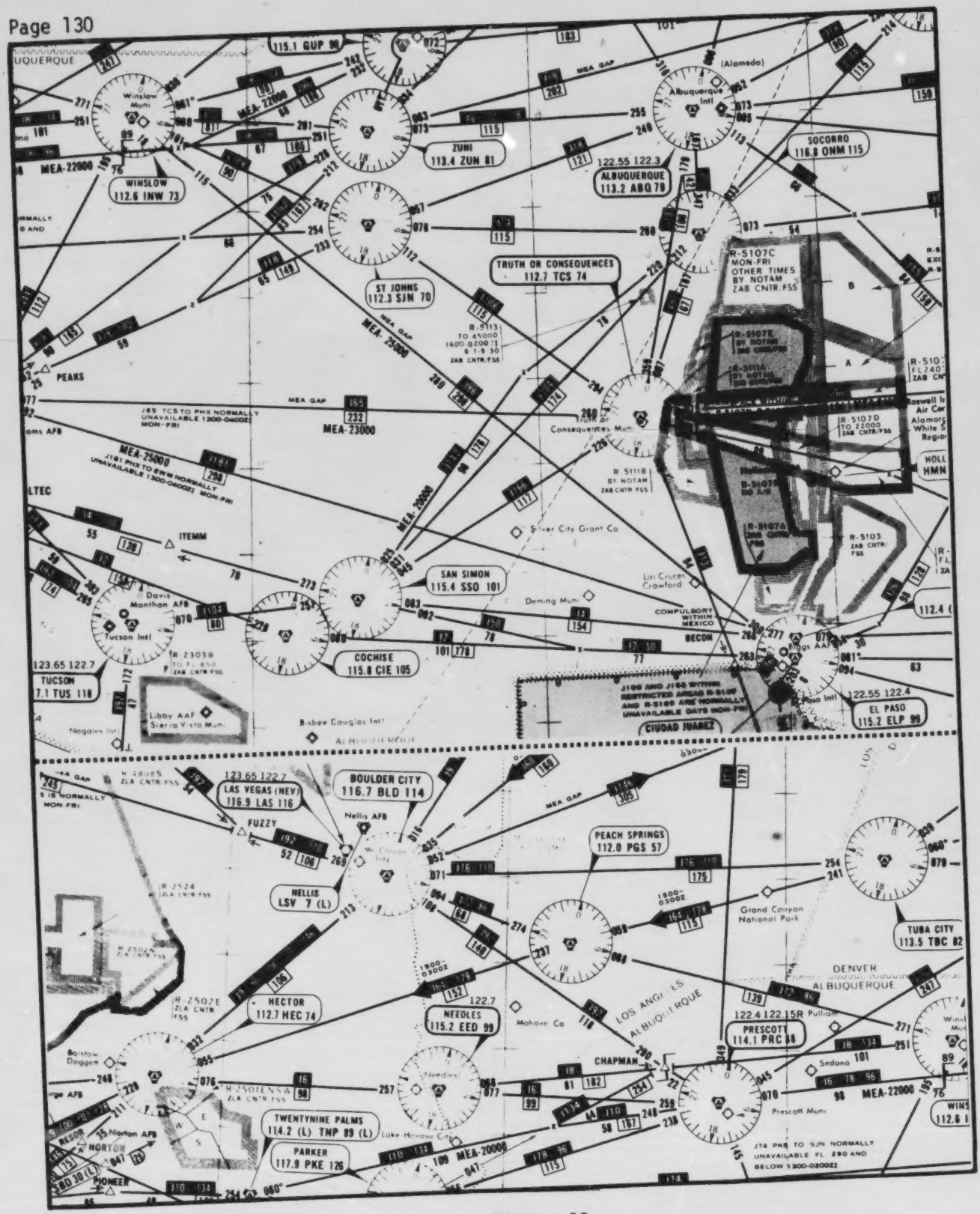

115.1 GUP 96
Albuquerque Intl
(Alameda)
SOCORRO
116.8 ONM 115
ZUNI
113.4 ZUN 81
122.55 122.3
ALBUQUERQUE
113.2 ABQ 79
WINSLOW
112.6 INW 73
MEA-22000
TRUTH OR CONSEQUENCES
112.7 TCS 74
ST JOHNS
112.3 SJN 70
MEA-25000
MEA-23000
PEAKS
R-5107C
MON-FRI
OTHER TIMES
BY NOTAM
ZAB CNTR/FSS
R-5107D
TO 22000
ZAB CNTR/FSS
R-5103
ZAB CNTR/FSS
R-5113
TO 45000
1600-0200Z‡
& 1 & 30
ZAB CNTR/FSS
R 5111B
BY NOTAM
ZAB CNTR FSS
Silver City Grant Co
ITEMM
SAN SIMON
115.4 SSO 101
Deming Muni
Las Cruces
Crawford
COMPULSORY
WITHIN
MEXICO
RECON
Davis
Monthan AFB
Tucson Intl
COCHISE
115.8 CIE 105
123.65 122.7
TUCSON
7.1 TUS 118
R 2303B
TO FL 450
ZAB CNTR FSS
Libby AAF
Sierra Vista Muni
Nogales Intl
Bisbee Douglas Intl
J100 AND J160 WITHIN
RESTRICTED AREAS R-5107
AND R-5103 ARE NORMALLY
UNAVAILABLE DAYS MON-FRI
CIUDAD JUAREZ
El Paso Intl
122.55 122.4
EL PASO
115.2 ELP 99
BOULDER CITY
116.7 BLD 114
123.65 122.7
LAS VEGAS (NEV)
116.9 LAS 116
FUZZY
Nellis AFB
PEACH SPRINGS
112.0 PGS 57
NELLIS
LSV 7 (L)
R 2524
ZLA CNTR FSS
Grand Canyon
National Park
TUBA CITY
113.5 TBC 82
DENVER
ALBUQUERQUE
R 2502E
ZLA CNTR
FSS
HECTOR
112.7 HEC 74
NEEDLES
115.2 EED 99
Mohave Co
LOS ANGELES
ALBUQUERQUE
122.4 122.15R Pullman
PRESCOTT
114.1 PRC
CHAPMAN
Sedona 101
MEA-22000
Barstow
Daggett
R 2501ENSW
ZLA CNTR FSS
TWENTYNINE PALMS
114.2 (L) TNP 89 (L)
Lake Havasu City
Prescott Muni
PARKER
117.9 PKE 126
MEA-20000
Norton AFB
NORTON
PIONEER
J74 PKE TO SJN NORMALLY
UNAVAILABLE FL 290 AND
BELOW 1300-0200Z‡

Figure 68

FLIGHT TIME ANALYSIS

CHECK POINTS		ROUTE	MACH NO.	WIND FACTOR	SPEED-KNOTS		DIST N.M.	TIME		FUEL CONSUMPTION (POUNDS)	
FROM	TO	ALTITUDE FLT/LEVEL		TEMPERATURE	TAS	GRND SPEED		LEG	TOTAL	LEG	TOTAL
ALBUQUERQUE INTL.	BLUE WATER INT.	8UW1.8UW	--	----	--	--	--	--	--	--	--
		CLIMB		----							
BLUE WATER INT.	LEVEL OFF	8UW1.INW	--	----	--	--	170	--	:26	--	*7,500
		CLIMB		----							
LEVEL OFF	INW VORTAC	8UW1.INW		-35 knots							
		FL 350		ISA +8°C.							
INW VORTAC	HEC VORTAC	J8-6		-35 knots							
		FL 350		ISA +8°C.							
HEC VORTAC	LOS ANGELES INTL.	HEC CIVET 1		----	--	--	--	:13		1,500	
		DESCENT	&	APPROACH							

OTHER DATA:

*INCLUDES 1,000 LBS. FUEL FOR TAXI ALLOWANCE.

NOTE: Use 9,350 PPH total fuel flow from level-off to the HEC VORTAC.

Use 8,350 PPH total fuel flow for reserve requirement.

FLIGHT SUMMARY

TIME	FUEL	
		ENROUTE
		RESERVE
--	1,500	MISSED APPROACH
		TOTAL

Figure 69

Questions 757, 758, 759, and 760 refer to a flight from Albuquerque International Airport to Los Angeles International Airport. Refer to the: (1) Flight Time Analysis, Fig. 69; (2) SID, Fig. 70, page 133; (3) Enroute High Altitude Chart excerpts, Fig. 71, page 134; and (4) STAR, Fig. 72, page 135.

757. What is the ETE at .78 Mach?

X11
1- 1 hour 34 minutes
2- 1 hour 31 minutes
3- 1 hour 28 minutes
4- 1 hour 24 minutes

758. What is the total fuel required at .78 Mach?

X12
1- 26,300 pounds
2- 25,500 pounds
3- 24,400 pounds
4- 23,800 pounds

759. What is the specific range in nautical air miles per 1,000 pounds of fuel from
X14 level-off to the HEC VORTAC using .78 Mach?

1- 43.9 NAM/1,000
2- 45.7 NAM/1,000
3- 47.3 NAM/1,000
4- 48.9 NAM/1,000

760. What approximate indicated Mach should be maintained to arrive over the HEC
X13 VORTAC 45 minutes after level-off?

1- .81 Mach
2- .79 Mach
3- .77 Mach
4- .76 Mach

Questions 761, 762, 763, and 764 refer to a flight from Albuquerque International Airport to Los Angeles International Airport. Refer to the: (1) Flight Time Analysis, Fig. 69, page 131; (2) SID, Fig. 70, page 133; (3) Enroute High Altitude Chart excerpts, Fig. 71, page 134; and (4) STAR, Fig. 72, page 135.

761. What is the ETE at .80 Mach?

X11
1- 1 hour 28 minutes
2- 1 hour 26 minutes
3- 1 hour 23 minutes
4- 1 hour 19 minutes

762. What is the total fuel required at .80 Mach?

X12
1- 25,600 pounds
2- 24,500 pounds
3- 23,600 pounds
4- 22,500 pounds

763. What is the specific range in nautical air miles per 1,000 pounds of fuel from
X14 level-off to the INW VORTAC using .80 Mach?

1- 46.3 NAM/1,000
2- 47.5 NAM/1,000
3- 48.7 NAM/1,000
4- 50.1 NAM/1,000

764. What approximate Mach should be maintained to arrive over the HEC
X13 VORTAC 38 minutes after passing the INW VORTAC?

1- .83 Mach
2- .82 Mach
3- .81 Mach
4- .80 Mach

Questions 765, 766, 767, and 768 refer to a flight from Albuquerque International Airport to Los Angeles International Airport. Refer to the: (1) Flight Time Analysis, Fig. 69, page 131; (2) SID, Fig. 70, page 133; (3) Enroute High Altitude Chart excerpts, Fig. 71, page 134; and (4) STAR, Fig. 72, page 135.

765. What is the ETE at .82 Mach?

X11
1- 1 hour 27 minutes
2- 1 hour 26 minutes
3- 1 hour 22 minutes
4- 1 hour 17 minutes

766. What is the total fuel required at .82 Mach?

X12
1- 25,200 pounds
2- 24,300 pounds
3- 23,500 pounds
4- 21,800 pounds

767. What is the specific range in nautical air miles per 1,000 pounds of fuel from
X14 the INW VORTAC to the HEC VORTAC using .82 Mach?

1- 46.3 NAM/1,000
2- 47.9 NAM/1,000
3- 49.0 NAM/1,000
4- 51.4 NAM/1,000

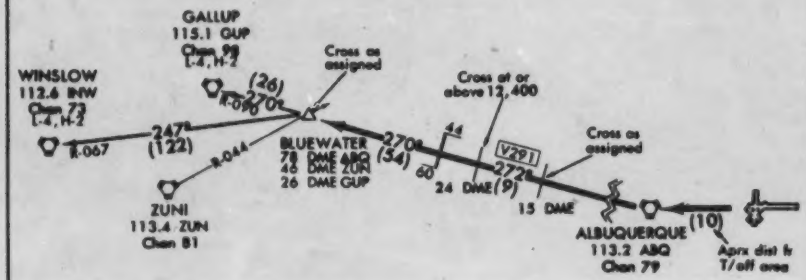
768. What approximate indicated Mach should be maintained to arrive over the HEC
X13 VORTAC 43 minutes after level-off?

1- .81 Mach
2- .79 Mach
3- .78 Mach
4- .76 Mach

BLUEWATER ONE DEPARTURE (8UW1.8UW)

ALBUQUERQUE INTL
ALBUQUERQUE, NEW MEXICO

ALBUQUERQUE GND CON
121.9 348.6
ALBUQUERQUE CLNC DELIVERY
119.2 385.6
ALBUQUERQUE TOWER
118.3 257.8
ALBUQUERQUE DEP CON
074°-254° 120.3 316.7
255°-073° 123.9 354.1
ALBUQUERQUE CENTER
125.2 307.2
ATIS
118.0



NOTE: Radar Vectored

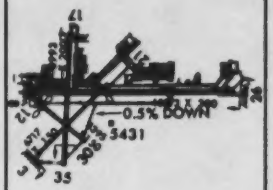
DEPARTURE ROUTE DESCRIPTION

Proceed via radar vectors, or as directed by departure control to intercept the ABQ R-272, then via the ABQ R-272 to BLUEWATER DME FIX. Cross a point 15 NM West of ABQ VORTAC as assigned. Cross a point 24 NM West of ABQ VORTAC at or above 12,400' MSL. Cross BLUEWATER DME FIX as assigned.

GALLUP TRANSITION (8UW1.GUP): Via GUP R-090 to GUP VORTAC.

WINSLOW TRANSITION (8UW1.INW): Via INW R-067 to INW VORTAC.

ELEV 5352



BLUEWATER ONE DEPARTURE (8UW1.8UW)

ALBUQUERQUE, NEW MEXICO
ALBUQUERQUE INTL

Figure 70

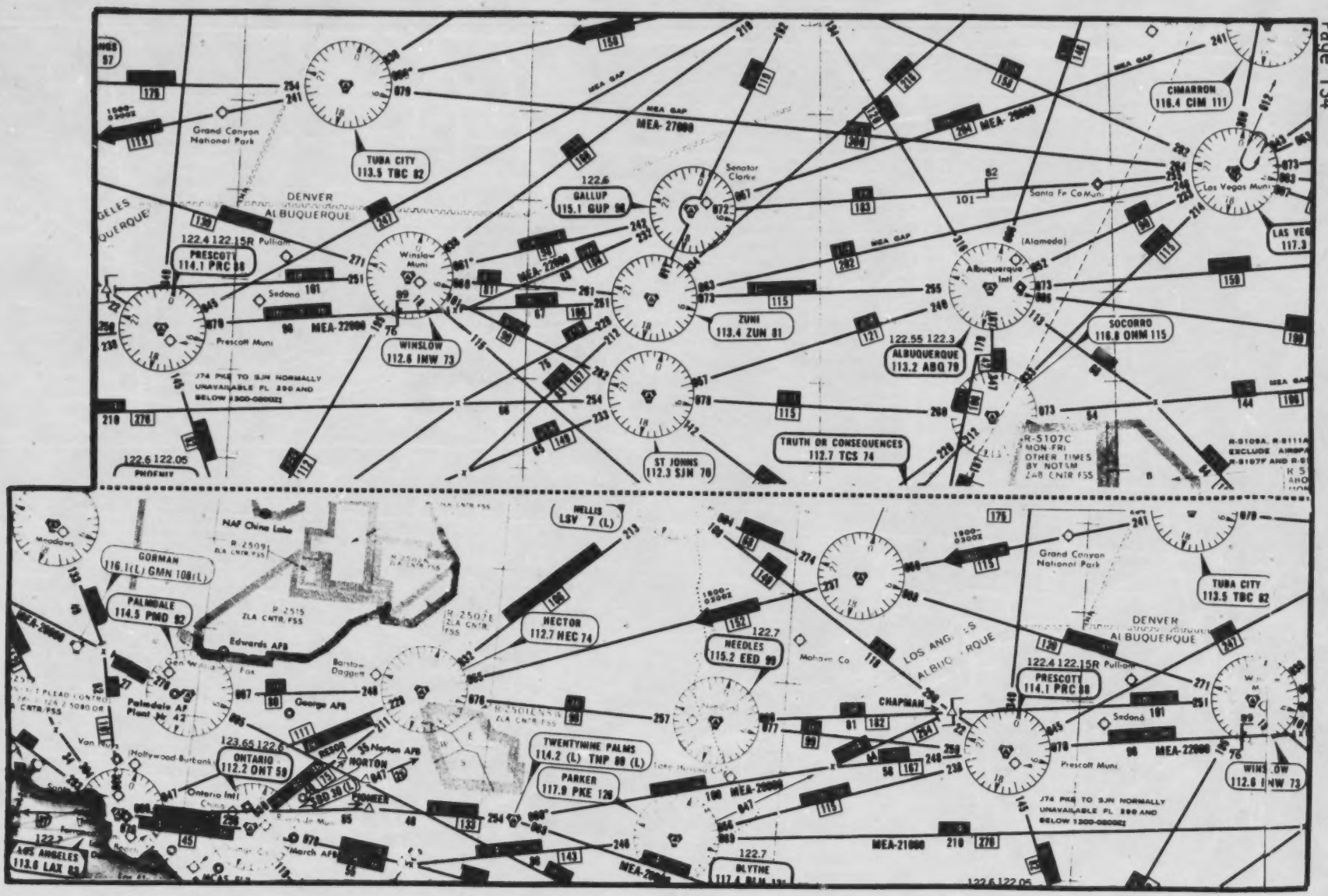
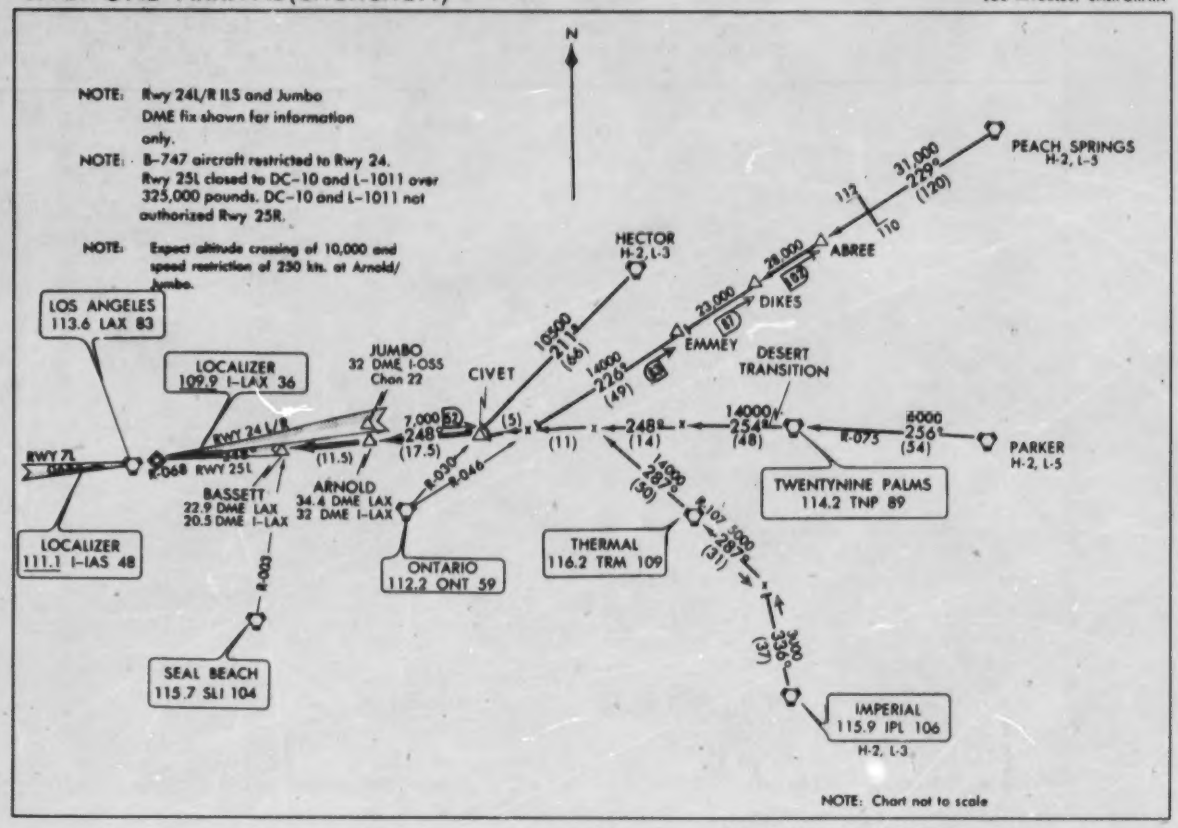

TUBA CITY
113.5 TBC 82
Grand Canyon National Park
DENVER
ALBUQUERQUE
GALLUP
115.1 GUP 98
Senator Clarke
Santa Fe Co Muni
CIMARRON
116.4 CIM 111
Las Vegas Muni
PRESCOTT
114.1 PRC 98
Winslow Muni
Sedona
Prescott Muni
ZUNI
113.4 ZUN 81
Albuquerque Intl
(Alameda)
WINSLOW
112.6 INW 73
ALBUQUERQUE
113.2 ABQ 79
SOCORRO
116.8 ONM 115
ST JOHNS
112.3 SJN 70
TRUTH OR CONSEQUENCES
112.7 TCS 74
MEA GAP
MEA-27000
MEA-22000
GORMAN
116.1(L) GMN 108(L)
PALMDALE
114.5 PMD 82
NAF China Lake
Edwards AFB
HECTOR
112.7 HEC 74
HELLIS
LSV 7 (L)
NEEDLES
115.2 EED 99
Mohave Co
LOS ANGELES
ALBUQUERQUE
CHAPMAN
Palmdale AP
George AFB
Barstow Daggett
Hollywood Burbank
Ontario Intl
ONTARIO
112.2 ONT 58
Norton AFB
TWENTYNINE PALMS
114.2 (L) TNP 89 (L)
PARKER
117.9 PKE 126
March AFB
LOS ANGELES
113.6 LAX 83
BLYTHE
MEA-21000
374 PKE TO SJN NORMALLY UNAVAILABLE FL 290 AND BELOW 1300-0800Z
R-5107C
MON FRI
OTHER TIMES
BY NOTAM
ZAB CNTR FSS

Figure 71

CIVET ONE ARRIVAL (CIVET.CIVET1)

LOS ANGELES INTERNATIONAL
LOS ANGELES, CALIFORNIA


N
NOTE: Rwy 24L/R ILS and Jumbo DME fix shown for information only.
NOTE: B-747 aircraft restricted to Rwy 24. Rwy 25L closed to DC-10 and L-1011 over 325,000 pounds. DC-10 and L-1011 not authorized Rwy 25R.
NOTE: Expect altitude crossing of 10,000 and speed restriction of 250 kts. at Arnold/Jumbo.
PEACH SPRINGS H-2, L-5
ABREE
DIKES
EMMEY
HECTOR H-2, L-3
LOS ANGELES 113.6 LAX 83
LOCALIZER 109.9 I-LAX 36
JUMBO 32 DME I-OSS Chan 22
CIVET
DESERT TRANSITION
RWY 24 L/R
RWY 25L
RWY 7L
BASSETT 22.9 DME LAX 20.5 DME I-LAX
ARNOLD 34.4 DME LAX 32 DME I-LAX
PARKER H-2, L-5
TWENTYNINE PALMS 114.2 TNP 89
LOCALIZER 111.1 I-IAS 48
ONTARIO 112.2 ONT 59
THERMAL 116.2 TRM 109
SEAL BEACH 115.7 SLI 104
IMPERIAL 115.9 IPL 106 H-2, L-3
NOTE: Chart not to scale

CIVET ONE ARRIVAL (CIVET.CIVET1)

LOS ANGELES INTERNATIONAL
LOS ANGELES, CALIFORNIA

ARRIVAL ROUTE DESCRIPTION

DESERT TRANSTION (TNP.CIVET1): From over TWENTYNINE PALMS VORTAC via TWENTYNINE PALMS R-254 and LOS ANGELES R-068 to CIVET INT. Thence . . . .

HECTOR TRANSITION (HEC.CIVET1): From over HECTOR VORTAC via HECTOR R-211 and ONTARIO R-030 to CIVET INT. Thence . . . .

IMPERIAL TRANSITION (IPL.CIVET1): From over IMPERIAL VORTAC via IMPERIAL R-336 and THERMAL R-107 and R-287 and LOS ANGELES R-068 to CIVET INT. Thence . . . .

PARKER TRANSITION (PKE.CIVET1): From over PARKER VORTAC via PARKER R-256 and TWENTYNINE PALMS R-075 to TWENTYNINE PALMS VORTAC. Via TWENTYNINE PALMS R-254 and LOS ANGELES R-068 to CIVET INT. Thence . . . .

PEACH SPRINGS TRANSITION (PGS.CIVET1): From over PEACH SPRINGS VORTAC via PEACH SPRINGS R-229 and ONTARIO R-046 and LOS ANGELES R-068 to CIVET INT. Thence . . . .

. . . . From CIVET INT. via LOS ANGELES ILS Rwy 25L Localizer east course/LAX R-068 via ARNOLD DME Fix to BASSETT INT. Expect ILS approach from Bassett Int, expect altitude crossing of 10,000' and speed restriction of 250 kts. at Arnold/Jumbo.

CIVET ONE ARRIVAL (CIVET.CIVET1)

LOS ANGELES, CALIFORNIA
LOS ANGELES INTERNATIONAL

Figure 72

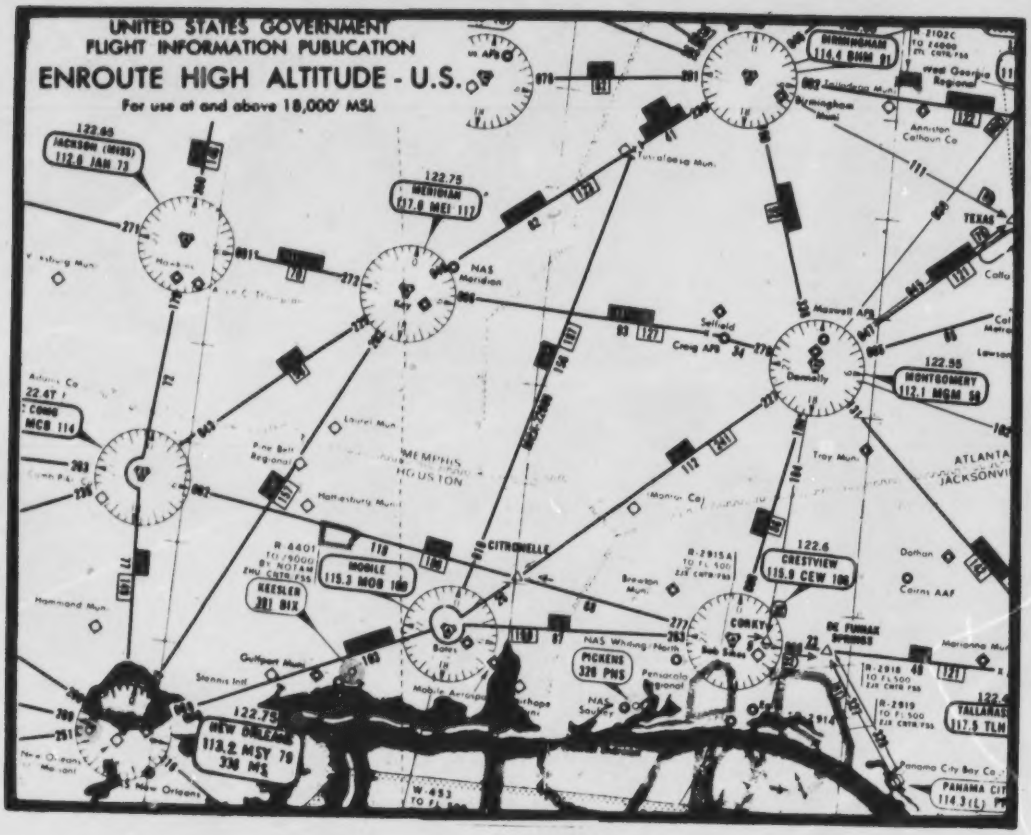


Figure 73

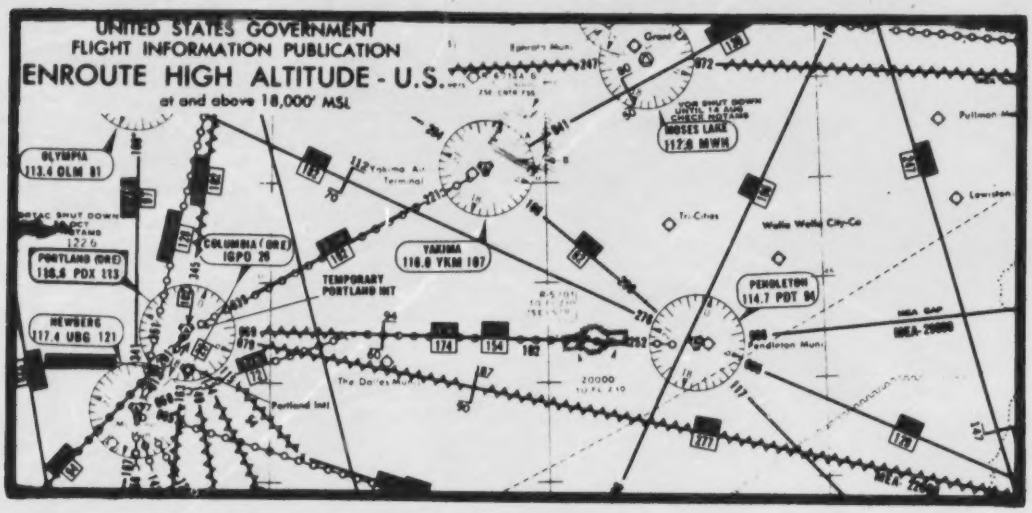


Figure 74

769. When holding above 14,000 feet MSL in a civil turbojet airplane, to what
T27 recommended maximum airspeed should you adhere to ensure proper airspace protection?

1- 200 knots
2- 210 knots
3- 220 knots
4- 230 knots

770. If you should enter severe turbulence, you should make the necessary power
Z17 adjustments and attempt to maintain

1- both a constant airspeed and altitude.
2- a level flight attitude.
3- a constant altitude.
4- a constant airspeed.

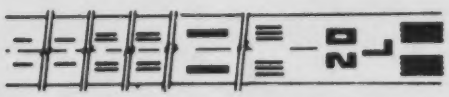
771. What should an airspeed indicator show if both the ram air input and
Z15 drain hole were completely blocked by ice, if an en route descent was made in a fixed thrust and pitch attitude condition?

1- The airspeed indication would drop to zero and remain at that value until the blockage was removed.
2- The airspeed indication would decrease.
3- No change would be indicated from the airspeed shown prior to the system being blocked.
4- The airspeed indication would increase.

772. Turbulence that is encountered above 15,000 feet ASL not associated with
V34 cumuliform cloudiness, including thunderstorms, should be reported as

1- severe turbulence.
2- light turbulence.
3- clear air turbulence.
4- moderate turbulence.

773. The distance from the approach end of the runway to the touchdown zone mark-
R24 ing is



1- 250 feet
2- 500 feet
3- 1,000 feet
4- 1,500 feet

774. What is the maximum range in nautical miles between VORTAC navigational aids
R13 for a direct flight at FL 410?

1- 100
2- 130
3- 200
4- 260

775. If both the ram air input and drain hole of the pitot system are blocked off,
Z15 what reaction to the airspeed indication should you be aware?

1- The airspeed indication would remain constant during a descent.
2- The airspeed indication would drop to and remain at zero until the blockage was removed.
3- Airspeed indications would not vary even if large power changes are made in level flight.
4- The airspeed indication would show a decrease in a climb.

776. At what DME on J-16 should a pilot change navigational aid reference on a flight
Q20 from the PDT VORTAC to the UBG VORTAC? (Fig. 74)

1- 60 NM
2- 94 NM
3- 102 NM
4- 154 NM

777. What is the total distance on J-16 between the PDT VORTAC and the UBG
Q20 VORTAC? (Fig. 74)

1- 154 NM
2- 162 NM
3- 166 NM
4- 174 NM

778. On a flight between the BHM and MSY VORTACs, which navigation facility(ies)
Q20 should be used to identify the intersection of J-69 and J-2? (Fig. 73)

1- MOB R-190 and MSY R-240
2- MOB VORTAC
3- CEW R-263 and MSY R-060
4- MOB R-010 and MSY R-060

779. Which navigation facility(ies) should be used to determine the intersection
Q20 of J-2 and J-37 between the MSY and MGM VORTACs? (Fig. 73)

1- MSY R-060 and MGM R-227
2- MOB R-047 and MSY R-060
3- MOB VORTAC and CEW R-263
4- MOB VORTAC

780. When landing at night on a CAT II runway, the high intensity runway
R25 edge lights will be white until the last

1- 2,000 feet.
2- 1,500 feet.
3- 1,200 feet.
4- 1,000 feet.

781. How should a pilot report turbulence encountered that, at least 2/3 of the
V34 time, causes changes in altitude and/or attitude, usually cause variations in airspeed, but the aircraft remains in control at all times?

1- Intermittent moderate turbulence.
2- Occasional moderate chop.
3- Intermittent moderate chop.
4- Occasional moderate turbulence.

782. If your flight encounters inflight weather conditions which have not
D45 been forecast, what action are you expected to take?

1- Make a complete report to the weather office on arrival at destination.
2- Report existing weather conditions to ATC.
3- Advise the nearest FSS on the emergency frequency.
4- Request the latest or revised weather conditions via company radio.

783. What effect will a change in wind direction have upon maintaining a 3° glide
Z17 slope at a constant true airspeed?

1- When groundspeed increases, rate of descent must increase.
2- Rate of descent must be constant to remain on the glide slope.
3- When groundspeed increases, rate of descent must decrease.
4- When groundspeed decreases, rate of descent must increase.

784. The recommended maximum indicated airspeed to use when holding at 10,000 feet
T27 MSL in a civil turbojet airplane is

1- 175 knots.
2- 200 knots.
3- 210 knots.
4- 230 knots.

785. What VHF frequencies are normally available for the Los Angeles FSS
Q11 as indicated by the heavy line communications box? (Fig. 75, Arrow 2)

1- 122.0, 122.2, 121.5, and 122.1R.
2- 122.2, 121.5, 122.7, and 122.1R.
3- 122.0, 122.7, 121.5, and 122.1R.
4- 122.2 and 121.5 only.

786. In addition to 122.7 and 122.1R, what additional VHF frequencies are normally
Q11 available for the Los Angeles FSS? (Fig. 75, Arrow 2)

1- 121.15 and 122.2.
2- 122.0, 121.15, and 122.2.
3- 122.2 and 121.5.
4- No other frequencies are available.

787. During periods of daylight saving time, what are the operating hours of the
Q11 EFAS?

1- 1300-0500Z
2- 1300-0500L
3- 1400-0600Z
4- 1500-0700Z

788. At what minimum altitude should you cross the POM VORTAC when flying north-
Q24 east on V8N? (Fig. 75, Arrow 1)

1- 11,500 feet MSL
2- 10,700 feet MSL
3- 10,300 feet MSL
4- 10,800 feet MSL

789. What frequency should be used to contact the Los Angeles Enroute Flight Advisory
Q11 Service? (Fig. 75, Arrow 2)

1- 121.1R
2- 122.0
3- 122.7
4- 120.0

790. At what minimum altitude should you cross the POM VORTAC when flying
Q24 northwest on V197? (Fig. 75, Arrow 1)

1- 4,500 feet MSL
2- 8,300 feet MSL
3- 10,000 feet MSL
4- 10,300 feet MSL

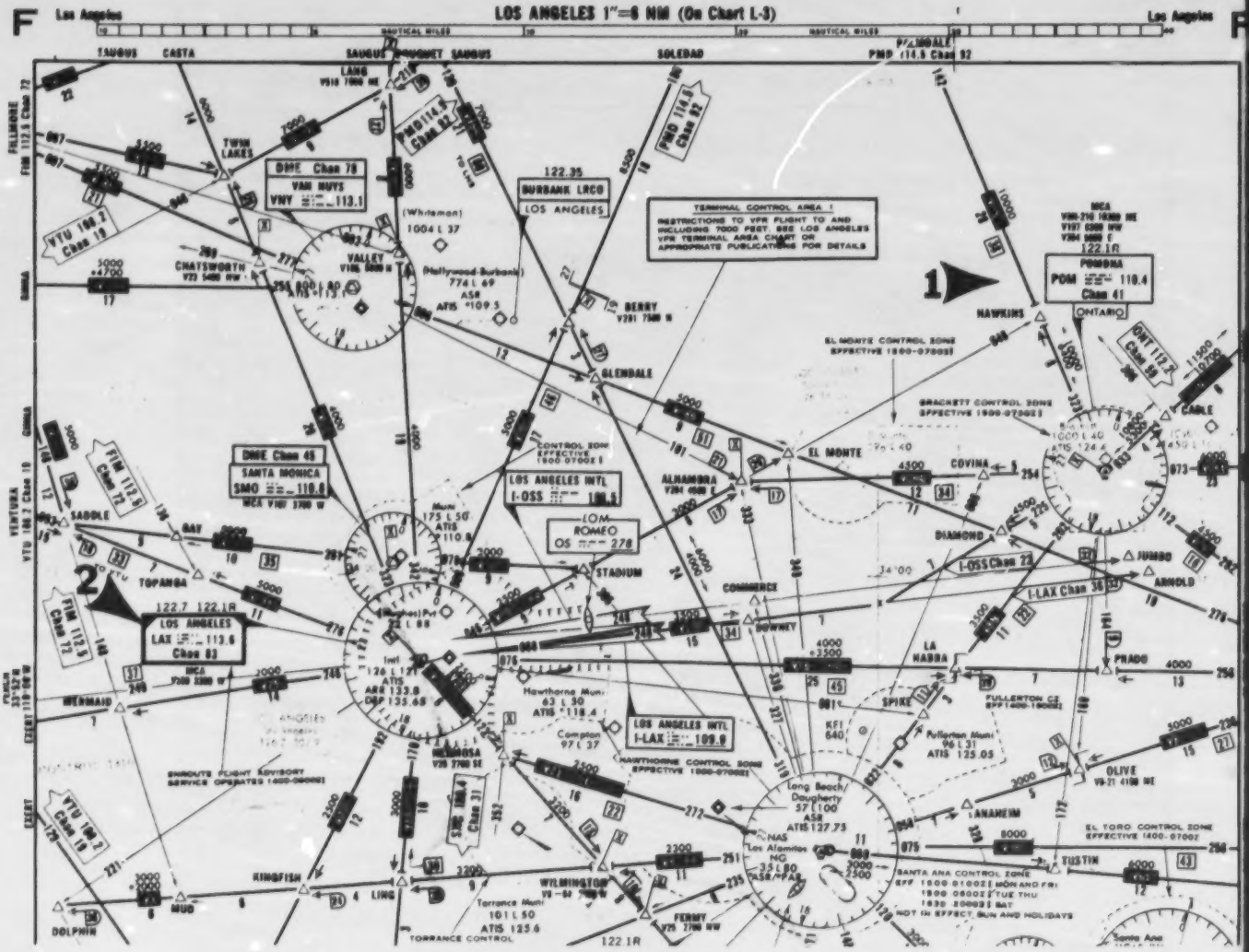

LOS ANGELES 1"=6 NM (On Chart L-3)
Los Angeles
TAUGUS
CASTA
SAUGUS
SOLEDAD
PALMDALE
PMD 114.6 Chan 92
LANG
TWIN LAKES
DRE Chan 78
VAN NUYS
VNY 113.1
(Whiteman)
1004 L 37
122.35
BURBANK LRCO
LOS ANGELES
TERMINAL CONTROL AREA 1
RESTRICTIONS TO VFR FLIGHT TO AND INCLUDING 7000 FEET. SEE LOS ANGELES VFR TERMINAL AREA CHART OR APPROPRIATE PUBLICATIONS FOR DETAILS
VTU 108.2 Chan 19
VALLEY
CHATSWORTH
(Hollywood Burbank)
774 L 69
ASR
ATIS 109.3
BERRY
GLENDALE
HAWKINS
PDM 110.4
Chan 41
ONTARIO
ONT 112.2 Chan 59
EL MONTE CONTROL ZONE EFFECTIVE 1800-0700Z
BRACKETT CONTROL ZONE EFFECTIVE 1800-0700Z
CABLE
DRE Chan 46
SANTA MONICA
SMO 110.8
FIM 112.9 Chan 72
LOS ANGELES INTL
I-OSS 108.5
LOM ROMEO OS 278
ALHAMBRA
EL MONTE
COVINA
SADDLE
BAY
DIAMOND
JUMBO
I-OSS Chan 22
I-LAX Chan 36
ARNOLD
TOPANGA
STADIUM
COMMERCE
FIM 113.5 Chan 72
122.7 122.1R
LOS ANGELES
LAX 113.6
Chan 83
DOWNEY
LA HABRA
PRADO
MERMAID
Hawthorne Muni
63 L 30
ATIS 118.4
Compton
97 L 37
LOS ANGELES INTL
I-LAX 109.9
HAWTHORNE CONTROL ZONE EFFECTIVE 1800-0700Z
SPIKE
KFI 640
Fullerton Muni
96 L 31
ATIS 125.05
FULLERTON CE EFF 1400-1800Z
SHROUTS FLIGHT ADVISORY SERVICE OPERATES 1400-0600Z
SAC 108.6 Chan 31
Long Beach/Daugherty
57 L 100
ASR
ATIS 127.75
NAS Los Alamitos NG
35 L 80
ASR/PAR
OLIVE
ANAHEIM
EL TORO CONTROL ZONE EFFECTIVE 1400-0700Z
TUSTIN
SANTA ANA CONTROL ZONE
EFF 1500 0100Z MON AND FRI
1500 0600Z TUE THU
1930 2400Z SAT
NOT IN EFFECT SUN AND HOLIDAYS
KINGFISH
MUD
LINC
WILMINGTON
Torrance Muni
101 L 50
ATIS 125.6
TORRANCE CONTROL
FERMY
DOLPHIN
122.1R
Santa Ana
1
2

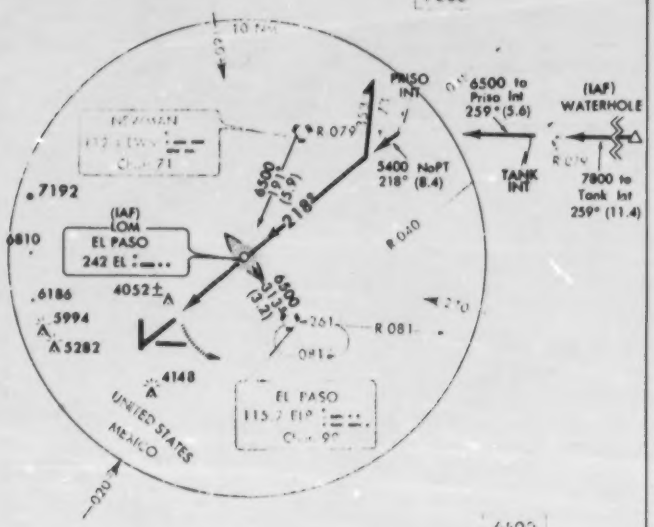
Figure 75

NDB RWY 22

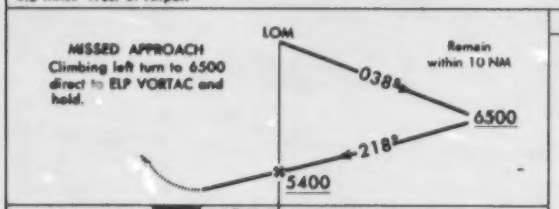
AL-134 (FAA)

EL PASO INTERNATIONAL
EL PASO, TEXAS

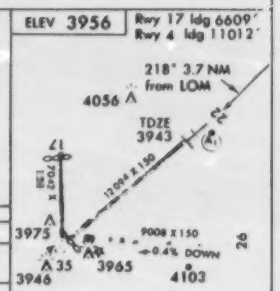
EL PASO APP CON
118.7 307.0
EL PASO TOWER
118.3 257.8
GND CON
121.9 348.6
CLNC DEL
125.0
ASR
ATIS 120.0



CAUTION: Steeply rising terrain
4.5 Miles West of Airport



CATEGORY	A	B	C	D	E
S-22	4360-¾ 417 (500-¾)			4360-1 417(500-1)	
CIRCLING	4420-1 464 (500-1)	4460-1 504 (600-1)	4460-1½ 504(600-1½)	4520-2 564 (600-2)	



MIRL Rwy 17-35
REIL Rwy 26
HIRL Rwys 4-22 and 8-26

FAF to MAP 3.7 NM					
Knots	60	90	120	150	180
Min:Sec	3:42	2:28	1:51	1:29	1:14

NDB RWY 22 31°48'N-106°23'W EL PASO, TEXAS
EL PASO INTERNATIONAL

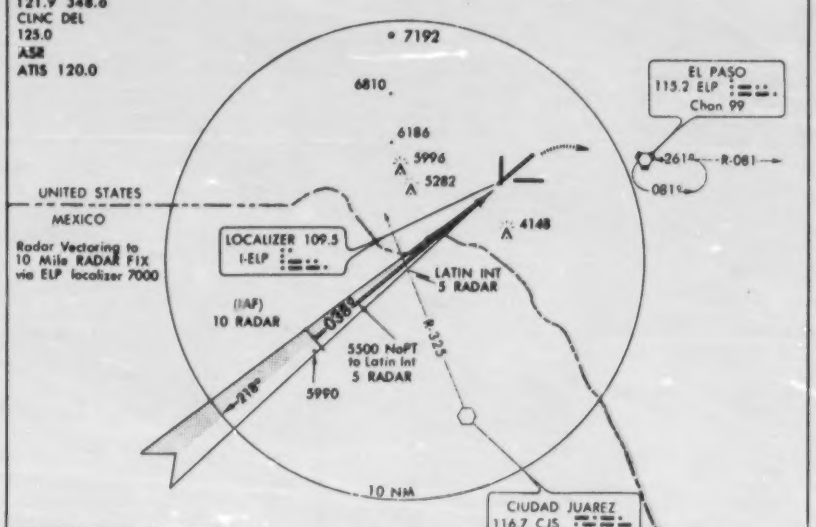
LOC BC RWY 4

AL-134(FAA)

EL PASO INTERNATIONAL
EL PASO, TEXAS

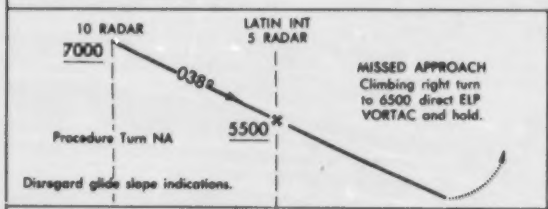
EL PASO APP CON
118.7 307.0
EL PASO TOWER
118.3 257.8
GND CON
121.9 348.6
CLNC DEL
125.0
ASR
ATIS 120.0

BACK COURSE



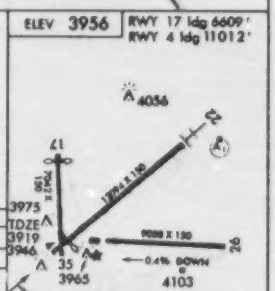
CAUTION: Steeply rising Terrain
4.5 miles West of Airport

RADAR REQUIRED



CATEGORY	A	B	C	D
S-4	4320-1 401 (400-1)			
CIRCLING	4420-1 464 (500-1)	4460-1 504 (600-1)	4460-1½ 504(600-1½)	4520-2 564 (600-2)

When Ciudad Juarez control zone not in effect, use of CJS VOR for FAF not authorized.



MIRL Rwy 17-35
REIL Rwy 26
HIRL Rwys 4-22 and 8-26

FAF to MAP 5 NM					
Knots	60	90	120	150	180
Min:Sec	5:00	3:20	2:30	2:00	1:40

LOC BC RWY 4 31°48'N - 106°23'W EL PASO, TEXAS
EL PASO INTERNATIONAL

166

Figure 76

Figure 77

167

791. When planning a direct flight at FL 350, the distance between VORTAC
S26 aids used should not be more than

1- 260 nautical miles apart.
2- 200 nautical miles apart.
3- 130 nautical miles apart.
4- 100 nautical miles apart.

792. On Enroute Low Altitude or Area Charts, which altitude ensures acceptable
Q24 signal coverage for accurate navigation only within 25 statute miles of a VOR/VORTAC?

1- MRA
2- MOCA
3- MCA
4- MEA

793. If you do not file for a specific Standard Instrument Departure (SID)
T14 on your flight plan, ATC

1- will ask if you will accept a SID before assigning one as part of your clearance.
2- will not assign a SID as part of your clearance.
3- will not assign a SID unless you request it when you call for your clearance.
4- may assign a SID if they deem it appropriate.

794. To what tolerances, with regard to proposed courseline and estimated
V20 time of penetration, should you adhere when penetrating a coastal ADIZ?

1- Plus or minus 20 miles; plus or minus 3 minutes.
2- Plus or minus 10 miles; plus or minus 10 minutes.
3- Plus or minus 20 miles; plus or minus 5 minutes.
4- Plus or minus 10 miles; plus or minus 5 minutes.

795. What aural and visual indications should be received when over the back course
R14 marker on a published back course ILS?

1- Two dots at the rate of 72 to 95 two-dot combinations per minute--white light.
2- Continuous dots at the rate of two dots per second--white light.
3- Two dots at the rate of 72 to 95 two-dot combinations per minute--amber light.
4- Continuous dots at the rate of six dots per second--blue light.

796. What is the highest elevation on RWY 4 between 11,012 feet and 11,512 feet?
Q40 (Fig. 77)

1- 3,965 feet MSL
2- 3,956 feet MSL
3- 3,946 feet MSL
4- 3,919 feet MSL

797. What is the highest elevation in the first 500 feet of the usable runway
Q40 for landing on RWY 4? (Fig. 77)

1- 3,919 feet MSL
2- 3,946 feet MSL
3- 3,956 feet MSL
4- 3,965 feet MSL

798. Which condition meets the criteria for executing a missed approach procedure
Q40 for a straight-in approach to RWY 4 at El Paso International Airport? (Fig. 77)

Airplane approach category - - C
V_{REF} approach speed- - - - - - 135 knots
Wind factor on final approach- Calm

1- At the expiration of 2 minutes at 4,460 feet MSL.
2- At the expiration of 2 minutes 15 seconds at 4,320 feet MSL.
3- At the expiration of 2 minutes 15 seconds or 4,320 feet MSL, whichever occurs first.
4- At the expiration of 2 minutes 15 seconds or 4,320 feet MSL, whichever occurs last.

799. Which condition meets the criteria for executing a missed approach procedure
Q40 for a straight-in NDB approach to RWY 22 at El Paso International Airport? (Fig. 76)

Airplane approach category - - D
V_{REF} approach speed- - - - - - 145 knots
Average headwind factor- - - - 10 knots

1- When 1 minute 20 seconds have elapsed regardless of altitude.
2- When 1 minute 40 seconds have elapsed or 4,360 feet MSL, whichever occurs last.
3- When 1 minute 40 seconds have elapsed at an altitude of 4,360 feet MSL.
4- When 1 minute 40 seconds have elapsed or 4,360 feet MSL, whichever occurs first.

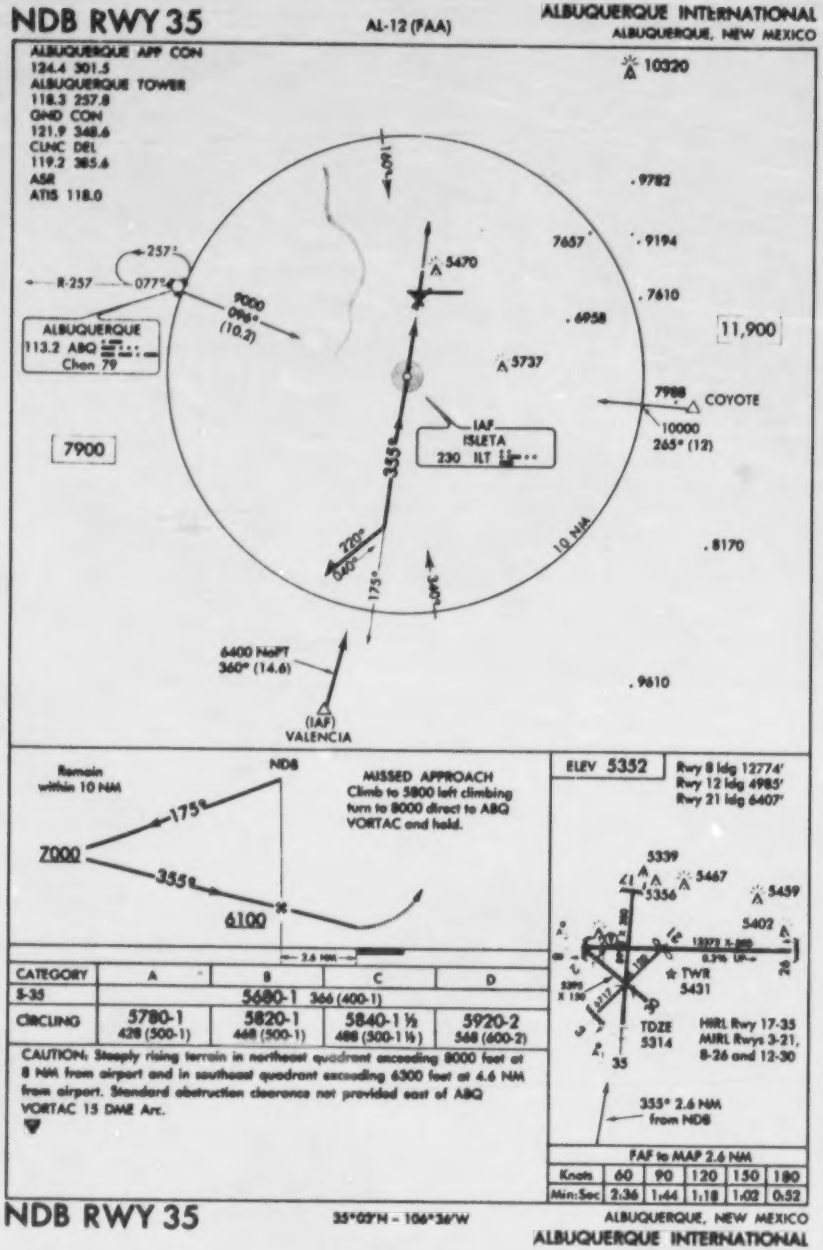


Figure 78

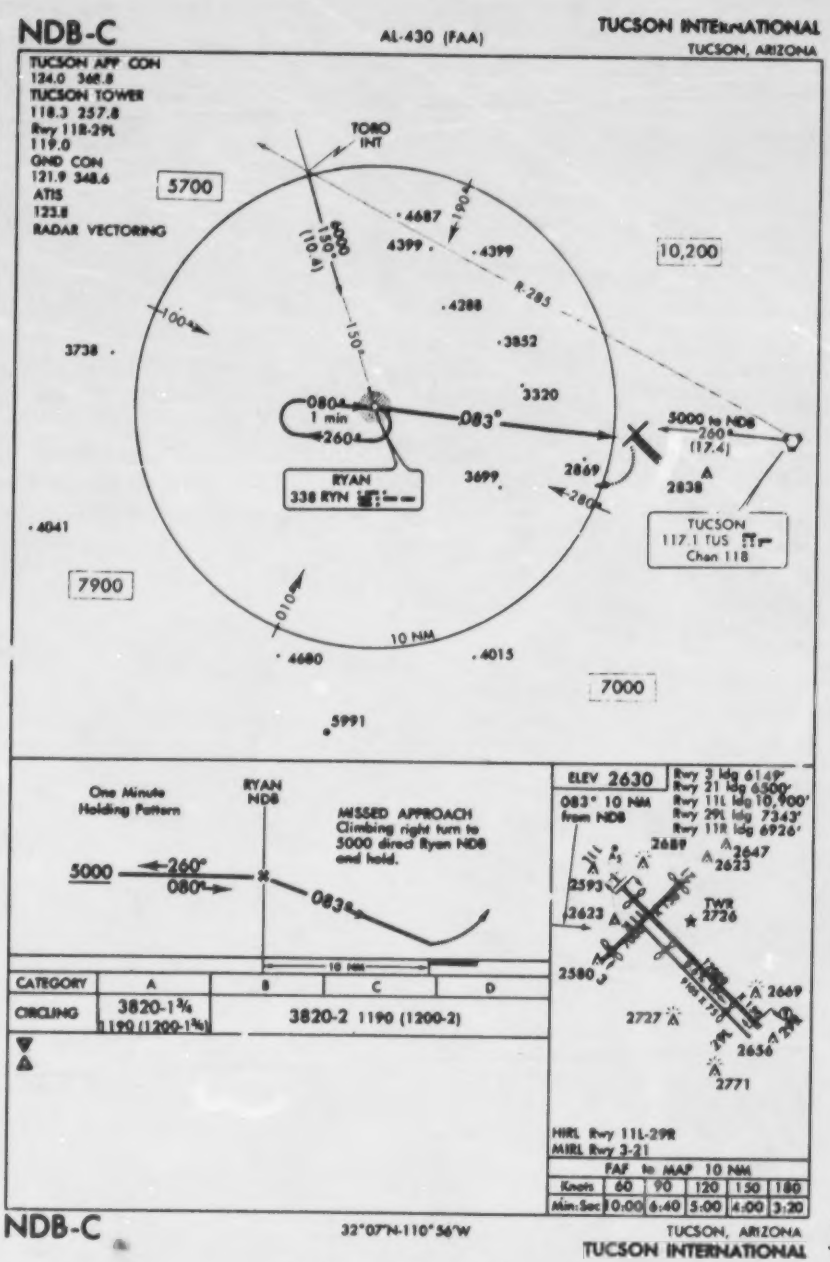


Figure 79

800. What is the purpose of the FDC NOTAMs?

S20

1- To provide the latest information on the status of navigation facilities to all FSS facilities for scheduled broadcasts.
2- To issue notices for all airports and navigation facilities in the shortest possible time.
3- To provide all information considered essential to flight safety in one publication.
4- To advise of regulatory changes in instrument approach procedures prior to their normal publication cycle.

801. Which condition meets the criteria for executing a missed approach procedure
Q40 for the NDB-C approach to Tucson International? (Fig. 79)

VREF approach speed - - - - -145 knots
Average headwind factor - - -10 knots
Airplane approach category- -C

1- 3,820 feet MSL or when 4 minutes have elapsed, whichever occurs first.
2- 3,920 feet MSL and when 4 minutes 30 seconds have elapsed.
3- 3,820 feet MSL or when 4 minutes 30 seconds have elapsed, whichever occurs last.
4- 3,920 feet MSL and when 4 minutes have elapsed.

802. Your FAR Part 121 flight time as pilot in command consists of only
I48 90 hours in a Boeing 727 type airplane. How does this flight experience affect the MDA and minimum visibility requirements for a straight-in instrument approach to RWY 35 in this type airplane? (Fig. 78. The airplane is approach category C. This is a destination airport.)

1- The minimums would remain the same.
2- MDA 5,780 feet MSL; visibility 1 1/2 miles.
3- MDA 5,580 feet MSL; visibility 2 miles.
4- MDA 5,680 feet MSL; visibility 1 1/2 miles.

803. Your FAR Part 121 flight time consists of only 80 hours as pilot in command
I48 of a Boeing 727 type airplane. What would be the MDA and minimum visibility requirements for a circling approach in this type airplane? (Fig. 78. The airplane is approach category D. This is an alternate airport.)

1- MDA 5,920 feet MSL; visibility 2 miles.
2- MDA 5,620 feet MSL; visibility 1 mile.
3- MDA 5,680 feet MSL; visibility 1 1/2 miles.
4- MDA 6,220 feet MSL; visibility 3 miles.

804. Your flight time in FAR Part 121 operations consists of only 97 hours as
I48 pilot in command of a Boeing 727 type airplane. How would this flight experience affect the MDA and minimum visibility requirements for a circling approach in this type airplane? (Fig. 78. This is an approach category C airplane. This is a destination airport.)

1- The landing minimums would remain as published.
2- MDA 5,940 feet MSL; visibility 1 1/2 miles.
3- MDA 5,840 feet MSL; visibility 2 miles.
4- MDA 5,940 feet MSL; visibility 2 miles.

805. Which conditions meet the criteria for executing a missed approach procedure
Q40 for a straight-in NDB approach to RWY 35 at Albuquerque International Airport? (Fig. 78)

VREF approach speed- - - - - - 140 knots
Average headwind factor- - - - 5 knots
Airplane approach category - - D

1- At 5,800 feet MSL and when 1 minute and 10 seconds have elapsed.
2- When 1 minute and 10 seconds have elapsed and altitude not below MDA.
3- At 5,680 feet MSL or when 1 minute and 10 seconds have elapsed, whichever occurs first.
4- When 1 minute and 10 seconds have elapsed or when 5,680 feet MSL is reached, whichever occurs last.

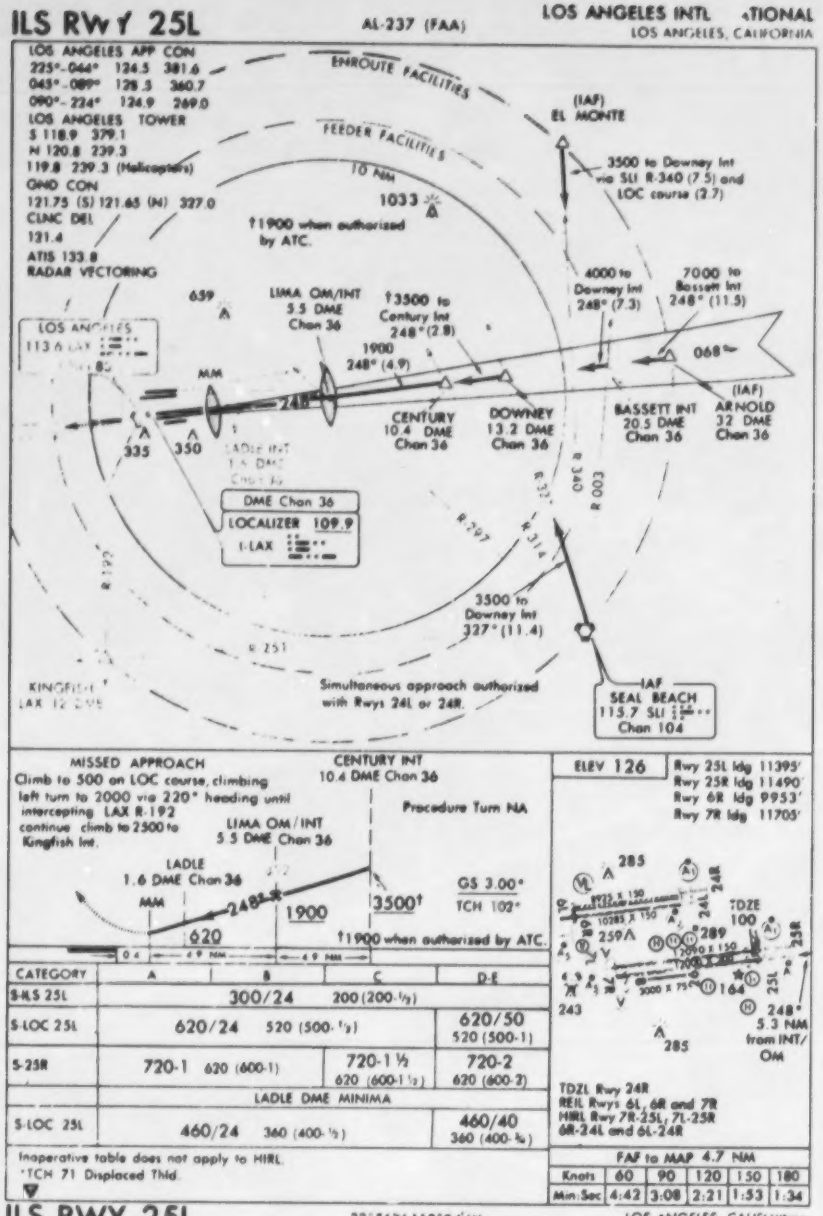

ILS RWY 25L
AL-237 (FAA)
LOS ANGELES INTL ATIONAL
LOS ANGELES, CALIFORNIA
LOS ANGELES APP CON
225°-044° 124.5 381.6
045°-089° 126.5 360.7
090°-224° 124.9 269.0
LOS ANGELES TOWER
S 118.9 379.1
N 120.8 239.3
119.8 239.3 (Helicopters)
GND CON
121.75 (S) 121.65 (N) 327.0
CLNC DEL
121.4
ATIS 133.8
RADAR VECTORING
ENROUTE FACILITIES
FEEDER FACILITIES
10 NM
(IAF) EL MONTE
3500 to Downey Int via SLI R-340 (7.5) and LOC course (2.7)
1033
†1900 when authorized by ATC.
4000 to Downey Int 248° (7.3)
7000 to Bassett Int 248° (11.5)
639
LIMA OM/INT 5.5 DME Chan 36
†3500 to Century Int 248° (2.8)
1900 248° (4.9)
068
LOS ANGELES 113.6 LAX
MM
24R
CENTURY 10.4 DME Chan 36
DOWNEY 13.2 DME Chan 36
BASSETT INT 20.5 DME Chan 36
(IAF) ARNOLD 32 DME Chan 36
335
350
LADLE INT 1.6 DME Chan 36
DME Chan 36
LOCALIZER 109.9
I-LAX
R 297
R 314
R 003
R 251
3500 to Downey Int 327° (11.4)
KINGFISH LAX 12.2
Simultaneous approach authorized with Rwys 24L or 24R.
IAF SEAL BEACH 115.7 SLI Chan 104
MISSED APPROACH
Climb to 500 on LOC course, climbing left turn to 2000 via 220° heading until intercepting LAX R-192 continue climb to 2500 to Kingfish Int.
CENTURY INT 10.4 DME Chan 36
LIMA OM/INT 5.5 DME Chan 36
Procedure Turn NA
LADLE 1.6 DME Chan 36
GS 3.00°
TCH 102'
620
1900
3500†
†1900 when authorized by ATC.
0.4
4.9 NM
4.9 NM
ELEV 126
Rwy 25L Idg 11395'
Rwy 25R Idg 11490'
Rwy 6R Idg 9953'
Rwy 7R Idg 11705'
285
TDZE 100
289
259
164
243
248°
5.3 NM from INT/OM
TDZL Rwy 24R
REIL Rwys 6L, 6R and 7R
HIRL Rwy 7R-25L, 7L-25R
6R-24L and 6L-24R
CATEGORY | A | B | C | D-E
S-ILS 25L | 300/24 | 200 (200-½) | |
S-LOC 25L | 620/24 | 520 (500-½) | | 620/50 520 (500-1)
S-25R | 720-1 620 (600-1) | | 720-1½ 620 (600-1½) | 720-2 620 (600-2)
LADLE DME MINIMA
S-LOC 25L | 460/24 | 360 (400-½) | | 460/40 360 (400-¾)
Inoperative table does not apply to HIRL.
†TCH 71 Displaced Thld.
FAF to MAP 4.7 NM
Knots | 60 | 90 | 120 | 150 | 180
Min:Sec | 4:42 | 3:08 | 2:21 | 1:53 | 1:34
ILS RWY 25L
33°56'N-118°24'W
LOS ANGELES, CALIFORNIA
LOS ANGELES INTERNATIONAL

Figure 80

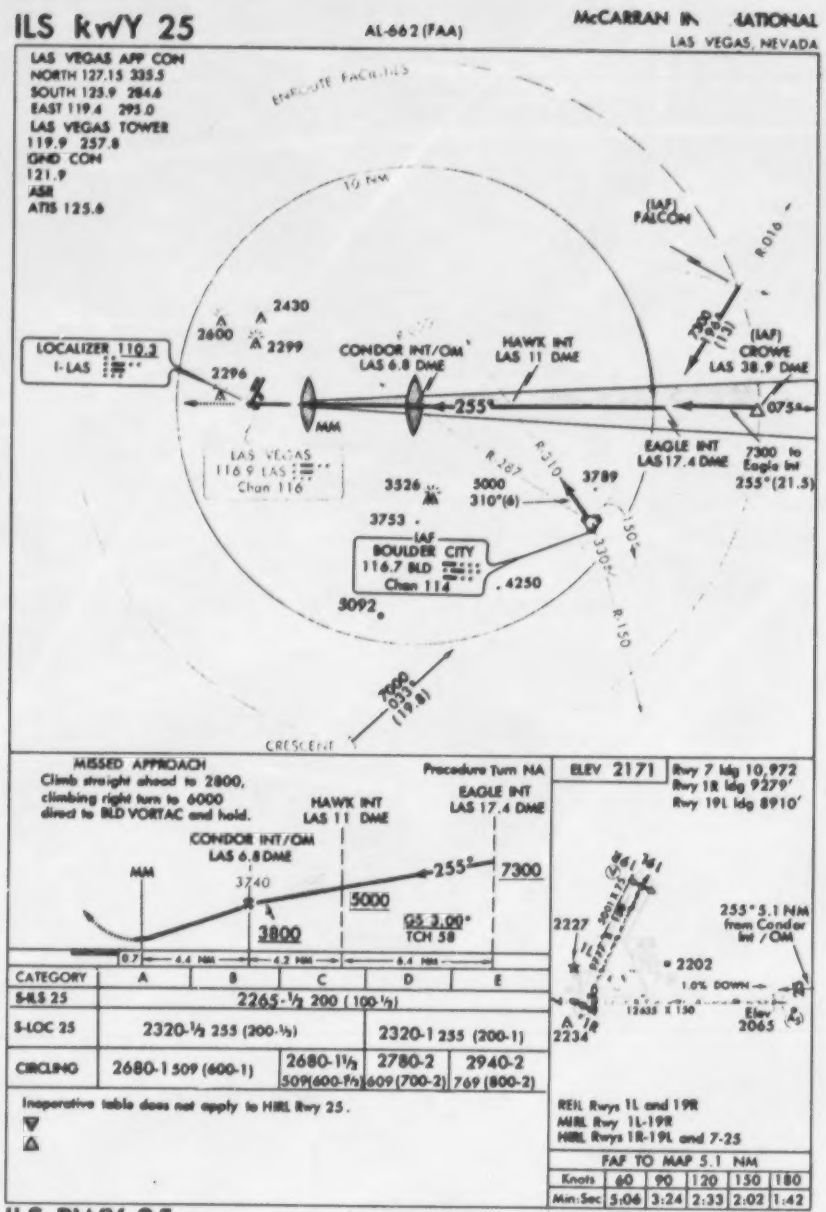


Figure 81

806. Your FAR Part 121 flight time consists of only 87 hours in a Boeing 727 type
I48 airplane as pilot in command. If Los Angeles International is the alternate airport, what effect, if any, would your flight experience have on the MDA and minimum visibility requirements for a side-step maneuver to a landing? (Fig. 80. The airplane is approach category C.)

1- MDA 1,020 feet MSL; visibility 2 1/2 miles.
2- MDA 720 feet MSL; visibility 2 miles.
3- MDA 820 feet MSL; visibility 2 1/2 miles.
4- The minimums would remain as published.

807. What is the significance of this symbol (✠) shown at LIMA OM/INT?
Q40 (Fig. 80)

1- It is the point at which the electronic glide slope should be intercepted for the complete ILS approach.
2- It represents the beginning of the final approach angle for vertical path computers.
3- It is the final approach fix for a localizer-only instrument approach.
4- It is that point at which the aircraft should be at 1,892 feet MSL on the ILS glide path.

808. As pilot in command of a Boeing 727 type airplane, you have logged only
I48 90 hours in FAR Part 121 operations. What would be the MDA and minimum visibility requirements for a side-step maneuver to a landing? (Fig. 80. Los Angeles International is the destination airport; the airplane is approach category C.)

1- MDA 720 feet MSL; visibility 1 3/4 miles.
2- MDA 820 feet MSL; visibility 2 miles.
3- MDA 560 feet MSL; visibility RVR 50.
4- MDA 820 feet MSL; visibility 2 1/2 miles.

809. What is the height of the electronic glide slope above the threshold for
Q40 RWY 25L? (Fig. 80)

1- 71 feet AGL
2- 83 feet AGL
3- 100 feet AGL
4- 102 feet AGL

810. Your FAR Part 121 flight time consists of only 95 hours as pilot in command of
I48 a Boeing 727 type airplane. If Los Angeles International is the destination airport, what would be the MDA and minimum visibility requirements to execute the side-step maneuver to a landing? (Fig. 80. The airplane is approach category D.)

1- MDA 1,020 feet MSL; visibility 3 miles.
2- MDA 820 feet MSL; visibility 2 1/2 miles.
3- MDA 720 feet MSL; visibility RVR 75.
4- MDA 560 feet MSL; visibility RVR 65.

811. What are the landing minimums for a side-step maneuver for an approach
Q40 category C airplane using DME? (Fig. 80)

1- 300/24
2- 460/24
3- 620/24
4- 720-1 1/2

812. What are the landing minimums for a side-step maneuver for an approach
Q40 category C airplane if the DME is inoperative? (Fig. 80)

1- 720-1 1/2
2- 620/24
3- 460/24
4- 300/24

813. What are the landing minimums for a side-step maneuver in an approach
Q40 category D airplane using DME? (Fig. 80)

1- 300/24
2- 460/40
3- 620/50
4- 720-2

814. What are the landing minimums for a side-step maneuver in an approach
Q40 category D airplane if the glide slope and DME are inoperative? (Fig. 80)

1- 720-2
2- 620/50
3- 460/40
4- 300/24

815. What is the highest elevation in the touchdown zone when landing on RWY 11L?
040 (Fig. 80)

1- 2,593 feet MSL
2- 2,581 feet MSL
3- 2,630 feet MSL
4- 2,623 feet MSL

816. Which condition indicates that you are at the MAP for the localizer-only
Q40 approach to RWY 11L in an approach category C airplane? (Fig. 82)

V_{REF} approach airspeed- - - 140 knots
Average headwind component- 5 knots

1- 3,180 feet MSL or when 2 minutes 04 seconds have elapsed, whichever occurs last.
2- When 2 minutes 32 seconds have elapsed regardless of altitude.
3- 3,180 feet MSL or when 2 minutes 04 seconds have elapsed, whichever occurs first.
4- 3,300 feet MSL and when 2 minutes 04 seconds have elapsed.

817. Your flight time under FAR Part 121 as pilot in command consists of only 95
I48 hours in a Boeing 727 type airplane. What affect would this flight experience have upon the approach minimums for a straight-in instrument approach to RWY 25 in this type airplane? (Fig. 81, page 144)

McCarran International - - Destination airport
Approach category- - - - - C
HIRL RWY 25- - - - - - - - Out of service

1- MDA--2,320; visibility--1 mile.
2- MDA--2,420; visibility--1/2 mile.
3- DH--2,365; visibility--1 mile.
4- DH--2,365; visibility--1 1/2 miles.

818. Which condition meets the criteria for executing a missed approach procedure
Q40 when making the localizer-only approach to RWY 25? (Fig. 81, page 144)

Airplane approach category- - D
V_{REF} approach speed - - - - - 135 knots
Wind factor - - - - - - - - - Calm

1- 2,520 feet MSL and when 2 minutes 17 seconds have elapsed.
2- When 2 minutes 33 seconds have elapsed, regardless of altitude.
3- 2,320 feet MSL or 2 minutes 17 seconds, whichever occurs first.
4- 2,320 feet MSL or 2 minutes 17 seconds, whichever occurs last.

819. Your flight time consists of only 92 hours in FAR Part 121 operations as
I48 pilot in command of a Boeing 727 type airplane. What would be the straight-in and circling approach MDAs and minimum visibility requirements if McCarran International is the destination airport? (Fig. 81, page 144. The airplane is approach category D.)

		MDA	Visibility
1-	S-LOC-25	2,420 ft.	1 mile
	CIRCLING	2,880 ft.	2 1/2 miles
2-	S-LOC-25	2,420 ft.	1 1/2 miles
	CIRCLING	2,880 ft.	2 1/2 miles
3-	S-LOC-25	2,320 ft.	1 mile
	CIRCLING	2,780 ft.	2 1/2 miles
4-	S-LOC-25	2,320 ft.	1 1/2 miles
	CIRCLING	2,780 ft.	2 miles

820. Your flight time in FAR Part 121 operations consists of only 93 hours as
I48 pilot in command of a Boeing 727 type airplane. What would be the DH, MDA (LOC only), and minimum visibility requirements based on your flight experience? (Fig. 81, page 144. McCarran International is the destination airport. The airplane is approach category C.)

1- DH 2,265 feet MSL; visibility 1/2 mile; MDA 2,320 feet MSL; visibility 1/2 mile.
2- DH 2,365 feet MSL; visibility 1/2 mile; MDA 2,920 feet MSL; visibility 1 1/2 miles.
3- DH 2,265 feet MSL; visibility 1 mile; MDA 2,420 feet MSL; visibility 1/2 mile.
4- DH 2,365 feet MSL; visibility 1 mile; MDA 2,420 feet MSL; visibility 1 mile.

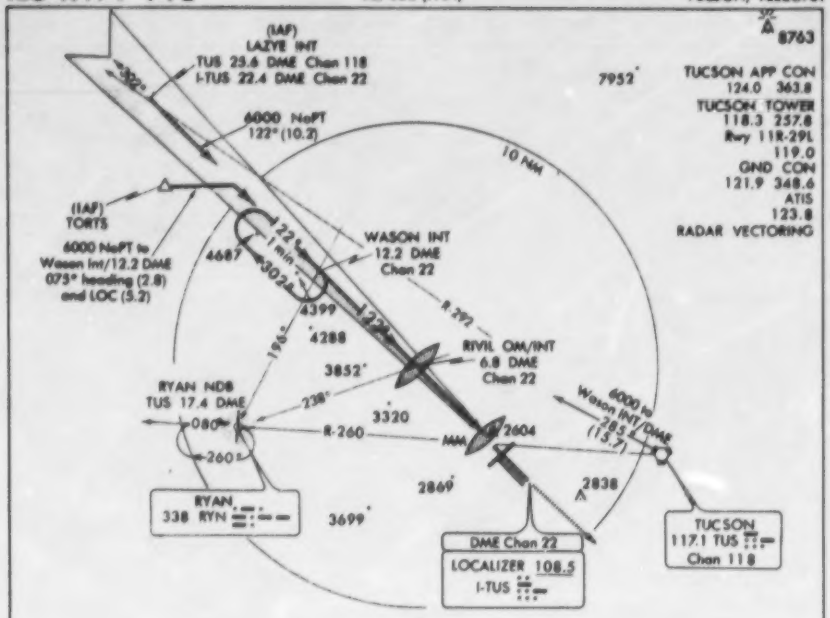
821. Your flight time consists of only 96 hours in FAR Part 121 operations as
I48 pilot in command of a Boeing 727 type airplane. What would be the straight-in MDA and minimum visibility requirements if McCarran International is the alternate airport? (Fig. 81, page 144. The airplane is approach category D.)

1- MDA 2,620 feet MSL; visibility 2 miles.
2- MDA 2,320 feet MSL; visibility 1 mile.
3- MDA 2,365 feet MSL; visibility 1 mile.
4- MDA 2,320 feet MSL; visibility 1/2 mile.

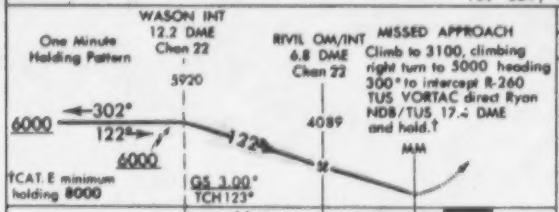
ILS RWY 11L

AL-430 (FAA)

TUCSON INTERNATIONAL
TUCSON, ARIZONA

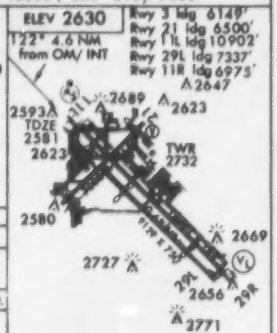


MIN SAFE ALT 25 NM FROM TUS VORTAC
310°-040° 10200'; 040°-130° 9700'
130°-220° 10500'; 220°-310° 7300'



CATEGORY	A and B	C	D	E
S-ILS 11L**	2781-½ 200 (200-½)			
S-LOC NA	When glide slope not utilized use LOC DME Rwy 11L approach procedure.			
CIRCLING	3080-1 450 (500-1)	3160-1½ 530 (600-1½)	3180-2 550 (600-2)	3600-2 970 (1000-2)

ADF or DME required.
**Cat E increase visibility ¼ mile with inoperative MALSR.
*TCH 58 Displaced Threshold.



FAF to MAP 4.4 NM					
Knots	60	90	120	150	180
Min:Sec	4:24	2:56	2:12	1:46	1:28

ILS RWY 11L

32°07'N – 110°56'W

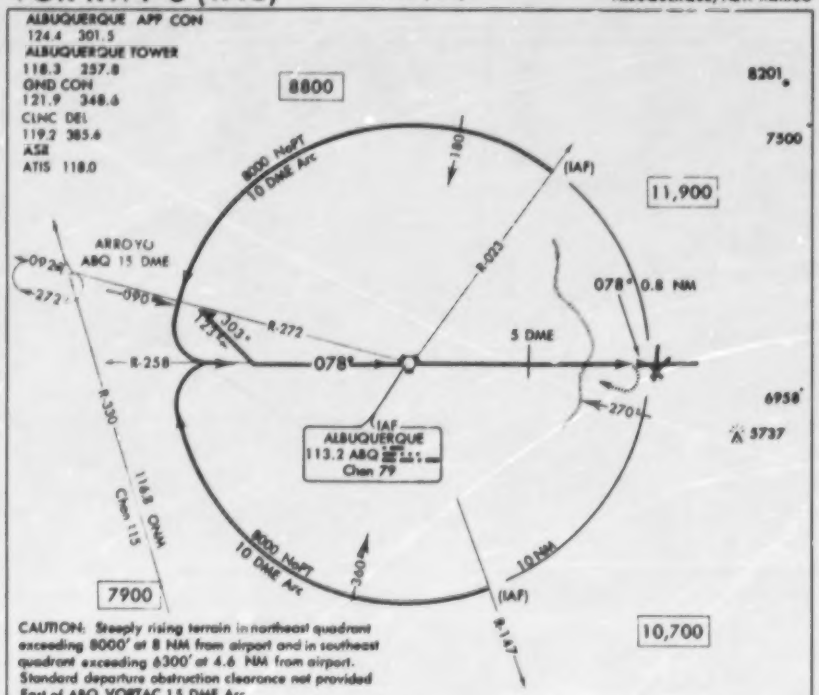
TUCSON INTERNATIONAL
TUCSON, ARIZONA

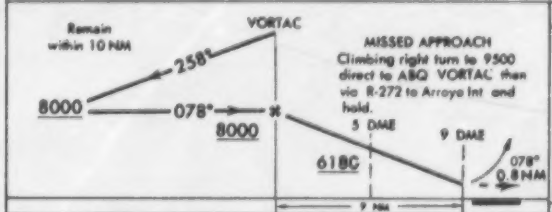
Figure 82

VOR RWY 8 (TAC)

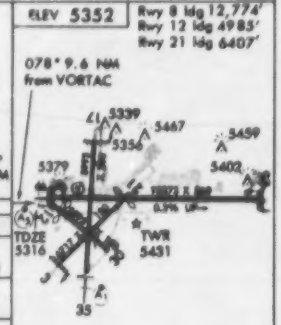
AL-12 (FAA)

ALBUQUERQUE INTERNATIONAL
ALBUQUERQUE, NEW MEXICO





CATEGORY	A	B	C	D
S-8	6180-1 864 (900-1)	6180-1¼ 864 (900-1¼)	6180-1½ 864 (900-1½)	6180-1¾ 864 (900-1¾)
CIRCLING	6180-1 828 (900-1)	6180-1¼ 828 (900-1¼)	6180-1½ 828 (900-1½)	6180-2 828 (900-2)
DME MINIMA				
S-8	5660-1 344 (400-1)			
CIRCLING	5780-1 428 (500-1)	5820-1 468 (500-1)	5840-1½ 488 (500-1½)	5920-2 568 (600-2)



FAF to MAP 9 NM					
Knots	60	90	120	150	180
Min:Sec	9:00	6:00	4:30	3:36	3:00

VOR RWY 8 (TAC)

35°03'N-106°36'W

ALBUQUERQUE, NEW MEXICO
ALBUQUERQUE INTERNATIONAL

Figure 83

822. Your FAR Part 121 flight time consists of only 90 hours as pilot in
I48 command of a Boeing 727 type airplane. If Albuquerque International is the alternate airport, what would be the MDA and minimum visibility requirements for a straight-in approach? (Fig. 83, page 147. The airplane is approach category D; DME is operable.)

1- MDA 6,220 feet MSL; visibility 2 miles.
2- MDA 5,920 feet MSL; visibility 2 miles.
3- MDA 6,020 feet MSL; visibility 2 1/2 miles.
4- MDA 5,920 feet MSL; visibility 3 miles.

823. Your flight time in FAR Part 121 operations consists of only 85
I48 hours as pilot in command of a Boeing 727 type airplane. If Albuquerque International is the destination airport, what would be the MDA and minimum visibility requirements for a straight-in approach? (Fig. 83, page 147. The airplane is approach category C; DME information is unreliable.)

1- MDA 5,760 feet MSL; visibility 1 1/2 miles.
2- MDA 6,280 feet MSL; visibility 2 miles.
3- MDA 6,280 feet MSL; visibility 1 1/2 miles.
4- MDA 6,180 feet MSL; visibility 2 miles.

824. Which indications would require you to initiate a missed approach pro-
Q40 cedure while on the VOR RWY 8 (TAC) approach to Albuquerque International Airport? (Fig. 83, page 147)

V_{REF} approach speed - - - - - 135 knots
Airplane approach category- - C
(Use DME minima.)

1- When 4 minutes 03 seconds have elapsed or 5,660 feet MSL is reached, whichever occurs last.
2- When 4 minutes have elapsed at an altitude of 6,180 feet MSL.
3- When 4 minutes 03 seconds have elapsed and altitude not below 5,660 feet MSL.
4- When 4 minutes 03 seconds have elapsed or 5,660 feet MSL is reached, whichever occurs first.

825. Your flight time in FAR Part 121 operations consists of only 89 hours as pilot
I48 in command of a Boeing 727 type airplane. If Tucson International is the destination, what would be the MDA and minimum visibility requirements for a straight-in approach? (Fig. 82, page 147. TUC VORTAC and MALSR are NOTAMed OTS. The airplane is approach category D.)

1- MDA 3,180 feet MSL; visibility 1 1/2 miles.
2- MDA 3,180 feet MSL; visibility 2 miles.
3- MDA 3,280 feet MSL; visibility 1 1/4 miles.
4- MDA 3,280 feet MSL; visibility 1 3/4 miles.

826. Your flight time in FAR Part 121 operations consists of only 93 hours as pilot
I48 in command of a Boeing 727 type airplane. If Tucson International is an alternate airport, would this flight experience affect the MDA and minimum visibility requirements for a straight-in approach? (Fig. 82, page 147. The airplane is approach category C. The RYAN NDB and MALSR and NOTAMed OTS.)

1- The MDA would be 2,860 feet and visibility 3/4 mile.
2- The MDA would be 2,881 feet MSL and visibility 1 mile.
3- No; the MDA and visibility would be as published.
4- The MDA would be 3,160 feet and visibility 1 1/2 miles.

827. Your flight experience in FAR Part 121 operations consists of only 98 hours as
I48 pilot in command of a Boeing 727 type airplane. If Tucson International is a destination airport, how would this flight experience affect the MDA and minimum visibility requirements for a straight-in approach? (Fig. 82, page 147. The airplane is approach category D. RYAN NDB and the MALSR are NOTAMed OTS.)

1- MDA 3,180 feet MSL; visibility 2 1/4 miles.
2- MDA 3,280 feet MSL; visibility 1 3/4 miles.
3- MDA 2,960 feet MSL; visibility 1 1/2 miles.
4- MDA 2,960 feet MSL; visibility 1 1/4 miles.

828. By what distance from the beginning of the runway surface is the threshold dis-
Q40 placed on RWY 11L? (Fig. 82, page 147)

1- 1,100 feet
2- 1,000 feet
3- 900 feet
4- 800 feet

829. Your flight time in FAR Part 121 operations consists of only 88 hours as
I48 pilot in command of a Boeing 727 type airplane. If Albuquerque International is a destination airport, what effect, if any, would your flight experience have on the MDA and minimum visibility requirements for a straight-in approach? (Fig. 83, page 147. The airplane is approach category D. The DME is NOTAMed OTS.)

1- MDA 6,180 feet MSL; visibility 2 1/4 miles.
2- MDA 6,180 feet MSL; visibility 1 3/4 miles.
3- MDA 6,280 feet MSL; visibility 2 3/4 miles.
4- MDA 6,280 feet MSL; visibility 2 1/4 miles.

830. A particular VORTAC station is undergoing routine maintenance. This is
R12 evidenced by

1- broadcasting a maintenance alert notice on the voice channel.
2- removal of the voice feature of the TACAN.
3- transmitting a series of dashes after each identification signal.
4- removal of the identification feature.

831. What type of hydroplaning results when steam, generated by friction,
Z16 supports an airplane tire off the runway surface?

1- Viscous hydroplaning.
2- Reverted rubber hydroplaning.
3- Thermal hydroplaning.
4- Dynamic hydroplaning.

832. When landing on a category II runway, what distance from the roll-out end
R23 of the runway will the runway edge lights be amber?

1- 2,000 feet
2- 1,500 feet
3- 1,000 feet
4- 500 feet

833. At what distance from the landing runway threshold does the fixed
R24 distance marker begin?

1- 1,500 feet
2- 1,200 feet
3- 1,000 feet
4- 500 feet

834. When designated in conjunction with an airport which has a published instru-
R32 ment approach procedure, what airspace is defined as a Transition Area?

1- Areas that are designated as Group I or Group II TCAs for which all aircraft are subject to the operating rules of FAR Part 91.
2- The airspace extending upward from the surface to 3,000 feet within a 5-statute mile radius from the center of an airport.
3- That airspace extending upward from the surface and terminating at the base of the overlying Continental Control Area (CCA).
4- That airspace extending upward from 700 feet or more AGL and terminating at the base of the overlying controlled airspace.

835. What service should you normally expect from an Enroute Flight Advisory Service
V30 station?

1- Severe weather information, changes to flight plans, and receive routine position reports.
2- Radar vectors for traffic avoidance, routine weather advisories, and altimeter settings.
3- Routine weather information and thunderstorm activity along your route.
4- Preferential routing and provide radar vectoring to circumnavigate severe weather.

836. When are ATIS broadcasts updated?

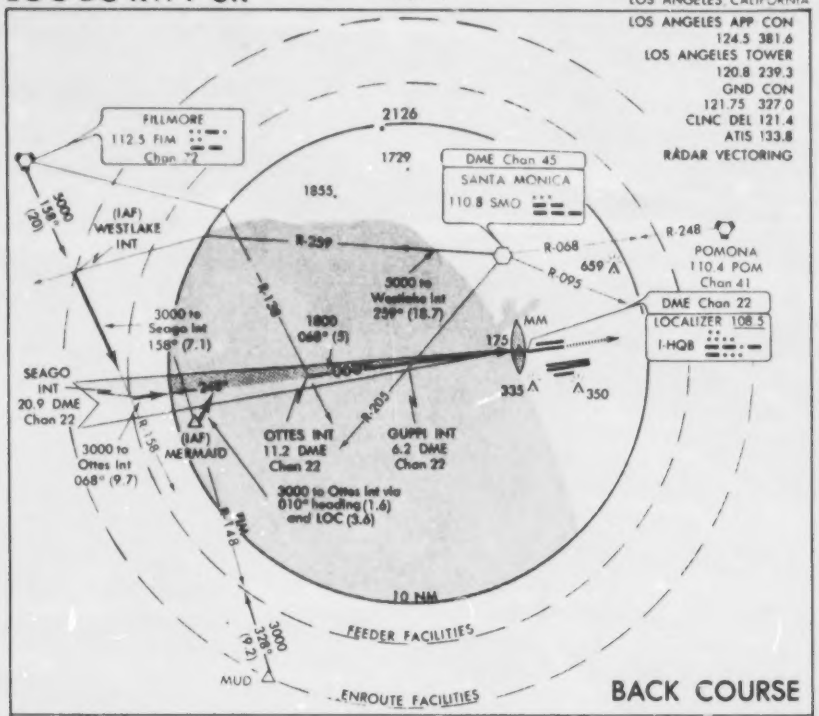
R42 1- Upon receipt of any official weather, regardless of content change and reported values.
2- Whenever the ceiling varies more than 100 feet and/or visibility more than 1 mile, or wind conditions dictate a change of primary runway(s) in use.
3- Hourly, regardless of weather conditions.
4- Every 30 minutes if weather conditions are below basic VFR; otherwise, hourly.

Amdt 2

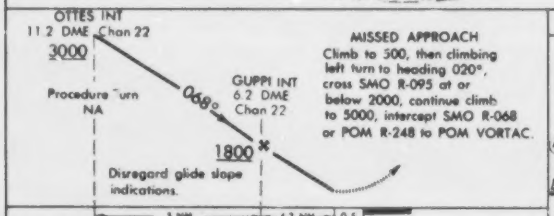
LOC BC RWY 6R

AL-237 (FAA)

LOS ANGELES INTERNATIONAL
LOS ANGELES, CALIFORNIA

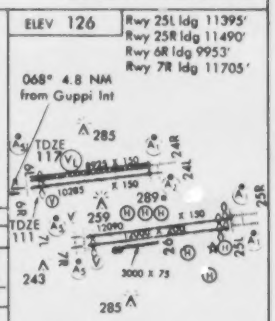


BACK COURSE



CATEGORY	A	B	C	D
S-LOC 6R*	400/24 289 (300-½)			400/40 289 (300-¾)
S-6L	720-2 603 (700-2)			

Inoperative table does not apply to HIRL Rwy 6R all categories.
* When MALSR inoperative, increase category D RVR to 5000.



TDZE Rwy 24R
REIL Rwys 6L, 6R and 7R
HIRL Rwys 7R-25L, 7L-25R
6R-24L and 6L-24R

FAF to MAP 4.3 NM					
Knots	60	90	120	150	180
Min:Sec	4:18	2:52	2:09	1:43	1:26

LOC BC RWY 6R
27 JAN

33°56'N – 118°24'W

LOS ANGELES, CALIFORNIA
LOS ANGELES INTERNATIONAL

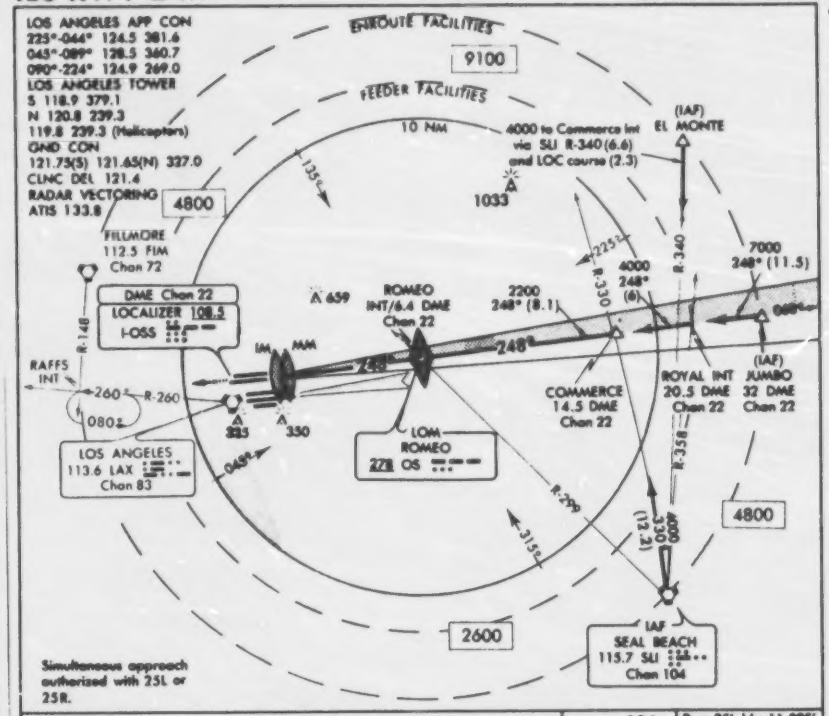
Figure 84

(CAT II)

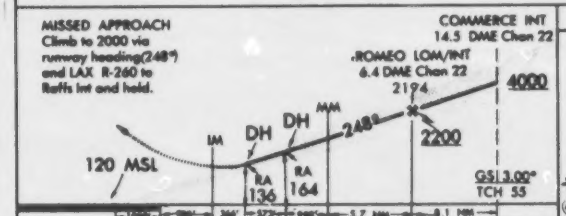
ILS RWY 24R

AL-237 (FAA)

LOS ANGELES INTERNATIONAL
LOS ANGELES, CALIFORNIA



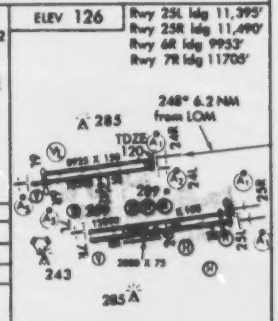
Simultaneous approach
authorized with 25L or
25R.



ALL AIRCRAFT	
S-ILS 24R	270/16 150(RA 164)
S-ILS 24R	240/12 120(RA 136)

Inoperative table does not apply to HIRL for Localizer minimums

CATEGORY II ILS – SPECIAL AIRCREW & AIRCRAFT CERTIFICATION REQUIRED



TDZL Rwy 24R
REIL Rwys 6L, 6R, and 7R
HIRL Rwys 7R-25L, 7L-25R, 6R-24L,
and 6L-24R

ILS RWY 24R
(CAT II)

33°56'N – 118°24'W

LOS ANGELES, CALIFORNIA
LOS ANGELES INTERNATIONAL

Figure 85

837. The vertical extent of the Positive Control Area throughout the conter-
R32 minous United States is from

1- FL 240 to FL 600.
2- 18,000 feet to FL 600.
3- 18,000 feet to FL 450.
4- 14,500 feet to FL 450.

838. If you takeoff behind a heavy jet that has just landed, you should
V35 plan to lift-off

1- past the point where it touched down.
2- prior to the point where it touched down and on the upwind edge of the runway.
3- prior to the point where it touched down.
4- at the point where it touched down.

839. What weather service is provided by an FSS having broadcast capability
V32 on VORs and NDBs?

1- AIRMETs and SIGMETs at 15 minutes past each hour, and every 15 minutes as long as they are in effect.
2- AIRMETs and SIGMETs during their valid time period when they pertain to the area within 450 NM of the FSS.
3- Weather reports 15 minutes past each hour, from reporting points within approximately 150 miles of the broadcasting station.
4- Weather reports, 15 and 45 minutes past each hour, from reporting points within approximately 150 miles of the broadcasting station.

840. When are you required to utilize the CAT II holding lines on a taxi-
Q40 way leading to RWY 24R? (Fig. 85)

1- At all times, since RWY 24R is approved for CAT II operations.
2- Any time you are operating an airplane equipped for CAT II operations.
3- When weather conditions are below CAT I instrument approach minimums.
4- Any time CAT II operations are in progress.

841. How should you establish contact with an Enroute Flight Advisory Service
V30 Station?

1- Call "FLIGHT WATCH" on 122.0.
2- Call "FLIGHT ADVISORY" on 122.1.
3- Call "METRO" on 127.0.
4- Call "ARTCC" on 122.5.

842. With an operative radio altimeter, to what DH are you authorized to descend
Q40 for a CAT II ILS to RWY 24R if the Inner Marker is NOTAMed OTS? (Fig. 85)

1- 120 feet MSL
2- 150 feet MSL
3- 240 feet MSL
4- 270 feet MSL

843. At what altitude AGL does the electronic glide slope cross the threshold
Q40 of RWY 24R? (Fig. 85)

1- 55 feet
2- 120 feet
3- 126 feet
4- 150 feet

844. What are the landing minimums for a side-step maneuver in an approach
Q40 category C airplane if the MALSR is inoperative for RWY 6R? (Fig. 84)

1- 400/50
2- 400/40
3- 720-2
4- 720/50

845. What is the highest elevation in the touchdown zone for RWY 6L? (Fig. 84)
Q40

1- 126 feet MSL
2- 117 feet MSL
3- 111 feet MSL
4- 100 feet MSL

846. What are the landing minimums for a side-step maneuver in an approach
Q40 category D airplane if the MALSR is inoperative for RWY 6R? (Fig. 84)

1- 720-2
2- 720/50
3- 400/40
4- 400/50

847. What is the highest elevation in the touchdown zone for RWY 6R? (Fig. 84)
Q40

1- 133 feet MSL
2- 126 feet MSL
3- 117 feet MSL
4- 111 feet MSL

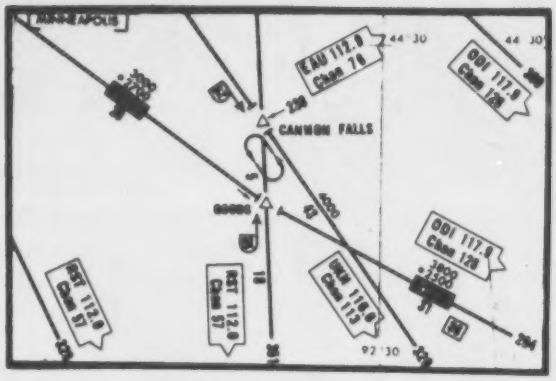


Figure 86

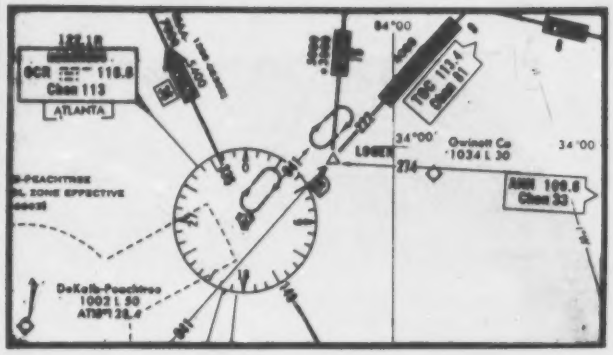


Figure 87

848. What term is used to identify the altitude which is in effect between
Q24 radio fixes on a VOR/LF airway that assures acceptable navigational signal coverage only within 22 nautical miles of a VOR/VORTAC station?

1- Minimum Enroute Altitude (MEA).
2- Minimum Reception Altitude (MRA).
3- Minimum Obstruction Clearance Altitude (MOCA).
4- Minimum Crossing Altitude (MCA).

849. When using a flight director system, what rate of turn or bank angle should
Z15 a pilot observe during turns in a holding pattern?

1- 3° per second or 25° bank, whichever is less.
2- 3° per second or 30° bank, whichever is less.
3- 1 1/2° per second or 25° bank, whichever is greater.
4- 1 1/2° per second or 30° bank, whichever is less.

850. At what point should the timing begin for the second leg outbound in the
T27 holding pattern over LOGEN Intersection? (Fig. 87)

1- Abeam the holding fix, or wings level, whichever occurs last.
2- When wings are level after completing turn to the appropriate outbound heading.
3- Abeam the holding fix, or wings level, whichever occurs first.
4- Abeam the holding fix.

851. What is the operational status of a VOR/VORTAC if you receive only the
R12 coded identifier approximately every 30 seconds?

1- Both the DME and VOR are operating normally.
2- The DME is operating normally; the VOR is inoperative.
3- Maintenance is being performed and neither the VOR nor DME is operating normally.
4- The DME is inoperative; the VOR is operating normally.

852. Within what minimum time does ATC expect a pilot to start a speed reduction from
T27 the holding fix?

1- 5 minutes
2- 3 minutes
3- 2 minutes
4- 1 minute

853. When should timing begin for the second leg outbound in the holding pattern
T27 over CANNON FALLS Intersection shown in Fig. 86? (DME NOTAMed OTS)

1- When wings are level after completing turn to appropriate outbound heading.
2- Abeam the holding fix, or wings level, whichever occurs first.
3- Abeam the holding fix, or wings level, whichever occurs last.
4- Abeam the holding fix.

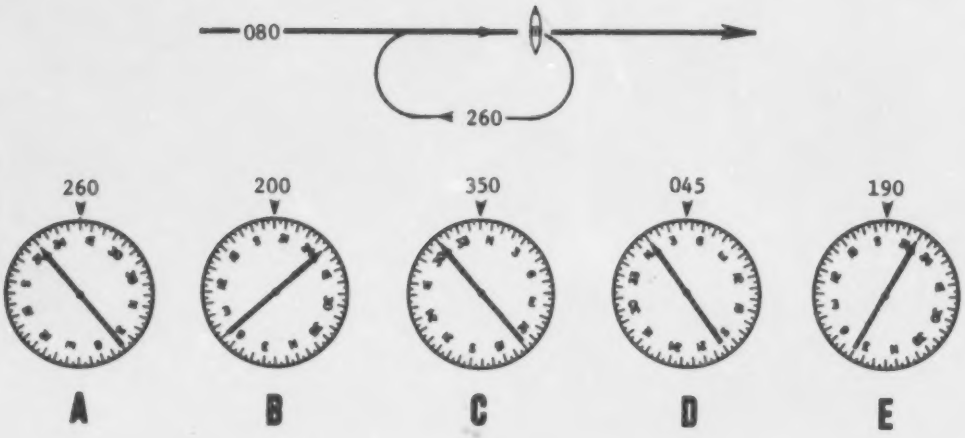


Figure 88

854. Z17 Of what initial cockpit indications should a pilot be aware when a constant headwind component shears to a calm wind?

1- Aircraft pitches up; altitude and indicated airspeed increase.
2- Aircraft pitches down; altitude and indicated airspeed decrease.
3- Aircraft pitches up; indicated airspeed decreases; altitude increases.
4- Aircraft pitches down; altitude decreases; indicated airspeed increases.

855. T27 As you arrive over the NDB, you observe the indications as shown in E. Which holding pattern entry procedure should you plan to use after station passage? (Fig. 88)

1- Direct or teardrop
2- Teardrop only
3- Parallel only
4- Direct only

856. T27 As you arrive over the NDB, you observe the indications as shown in D. Which holding pattern entry procedure should you plan to use after station passage? (Fig. 88)

1- Parallel only
2- Teardrop only
3- Direct only
4- Direct or parallel

857. T27 As you arrive over the NDB, you observe the indications as shown in C. Which holding pattern entry procedure should you plan to use after station passage? (Fig. 88)

1- Direct only
2- Teardrop or parallel
3- Parallel only
4- Parallel or direct

858. T27 As you arrive over the NDB, you observe the indications as shown in B. Which holding pattern entry procedure should you plan to use after station passage? (Fig. 88)

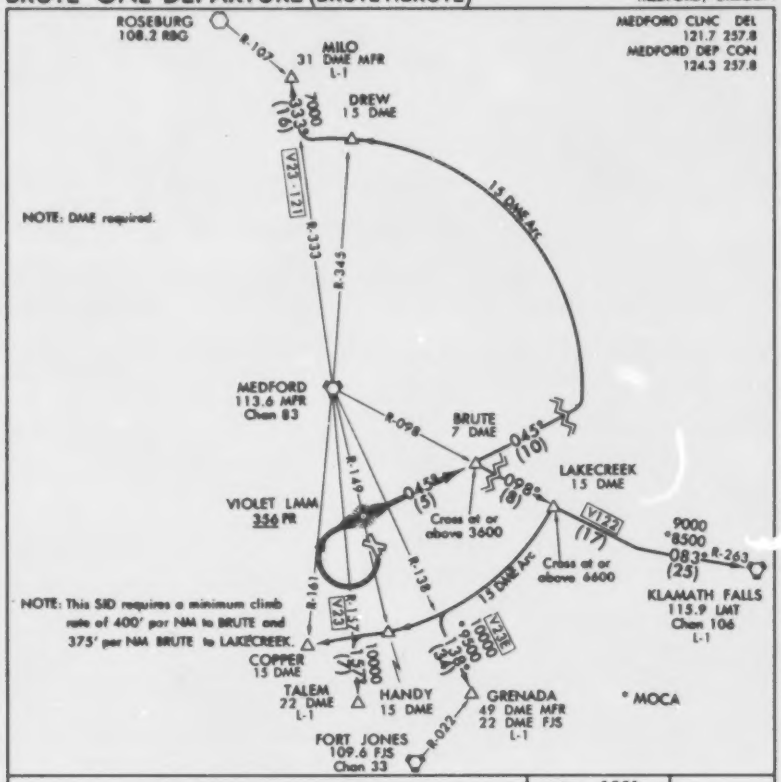
1- Direct only
2- Teardrop or direct only
3- Parallel only
4- Teardrop only

859. T27 As you arrive over the NDB, you observe the indications as shown in A. Which holding pattern entry procedure should you plan to use after station passage? (Fig. 88)

1- Teardrop only
2- Direct only
3- Teardrop or parallel
4- Direct or parallel

BRUTE ONE DEPARTURE (BRUTE1.BRUTE)

MEDFORD-JACKSON CO
MEDFORD, OREGON



DEPARTURE ROUTE DESCRIPTION

Climb direct to the VIOLET ILS Middle Compass Locat or (south take-off turn right), then climb on the 045° magnetic bearing from the LMM to cross BRUTE DME Fix at or above 3600'. Thence via (transition).

DREW TRANSITION (BRUTE1.4DU) Continue via 045° magnetic bearing from LMM to intercept MEDFORD 15 DME Arc, Thence turn left via 15 DME Arc to DREW DME Fix.

GRENADA TRANSITION (BRUTE1.4GT): Turn right via V122 to LAKECREEK DME Fix, cross LAKECREEK at or above 6600'; thence turn right via MEDFORD 15 DME Arc to intercept V23E to GRENADA INT.

(Continued on next page)

ELEV 1331

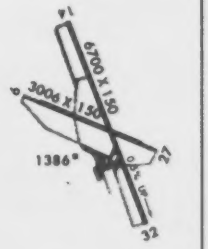


Figure 89

BRUTE ONE DEPARTURE (BRUTE1.BRUTE)

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DEPARTURE ROUTE DESCRIPTION
(Continued)

HANDY TRANSITION(BRUTE1.HANDY): Turn right via V122 to LAKECREEK DME Fix, cross LAKECREEK at or above 6600'; thence turn right via MEDFORD 15 DME Arc to HANDY DME Fix.

KLAMATH FALLS TRANSITION(BRUTE1.LMT): Turn right to V122 to KLAMATH FALLS VORTAC, Cross LAKECREEK DME Fix at or above 6600'.

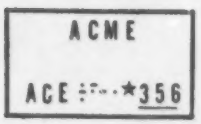
MILO TRANSITION(BRUTE1.4MI): Continue via 045° magnetic bearing from LMM to intercept MEDFORD 15 DME Arc, thence turn left via 15 DME Arc to intercept V23-121 to MILO INT.

TALEM TRANSITION(BRUTE1.TALEM): Turn right via V122 to LAKECREEK DME Fix, cross LAKECREEK at or above 6600'; thence turn right via MEDFORD 15 DME Arc to intercept V23 to TALEM DME Fix.

COPPER TRANSITION (BRUTE1.4QP): Turn right via V122 to LAKECREEK DME Fix, cross LAKECREEK at or above 6600', thence turn right via MFR 15 DME Arc to COPPER DME Fix.

860. At what distance from the landing runway threshold does the touch-
R24 down zone marker begin?

1- 1,000 feet
2- 500 feet
3- 300 feet
4- 200 feet



861. What operational status is indicated for the low frequency NDB
Q11 shown above?

1- The facility is unreliable; check NOTAMs for specific information.
2- Continuous voice capability is available on a 24-hour basis.
3- The radio beacon does not operate continuously; no voice capability.
4- Voice capability is available but only during specified hours of operation.

"CLEARED AS FILED. MAINTAIN SEVEN THOUSAND. EXPECT FLIGHT LEVEL TWO FIVE ZERO FIVE MINUTES AFTER DEPARTURE. MAINTAIN RUNWAY HEADING FOR RADAR VECTOR TO JOIN J37. SQUAWK 0105...." (ATL weather is 100 obscured and one-half mile in fog.)

862. You depart RWY 27R at William B. Hartsfield International after
V12 receiving the above clearance and experience complete two-way communications failure. The course of action ATC expects you to take is to

1- turn immediately to intercept J37. At 5 minutes after departure, climb to your flight planned altitude.
2- maintain runway heading until reaching 7,000 feet MSL, then turn to intercept J37 and climb to FL 250.
3- maintain runway heading for 5 minutes, then turn to intercept J37 and climb to FL 250.
4- turn immediately to intercept J37, and climb to FL 250 5 minutes after departure.

863. What term is used to describe hydroplaning which occurs when an airplane's
Z16 tire is effectively held off a smooth runway surface by steam generated by friction?

1- Frictional hydroplaning.
2- Reverted rubber hydroplaning.
3- Dynamic hydroplaning.
4- Viscous hydroplaning.

864. What does this symbol (▽) indicate when it appears on an instrument
Q40 approach procedure chart?

1- Takeoff minimums are non-standard and a certain IFR departure procedure may have been established for obstruction avoidance after takeoff.
2- Takeoff minimums are standard for aircraft with three or more engines.
3- Takeoff minimums are non-standard only for air carrier operations; consult a separate listing.
4- A SID has been published for that airport.

865. What is the total distance from the VIOLET LMM to HANDY DME fix via the
T14 BRUTE1.HANDY transition? (Fig. 89)

1- 35 NM
2- 32 NM
3- 29 NM
4- 25 NM

866. What is the total distance from the VIOLET LMM to TALEM DME fix via the
T14 BRUTE1.TALEM transition? (Fig. 89)

1- 39 NM
2- 35 NM
3- 33 NM
4- 28 NM

867. What is the total distance from the VIOLET LMM to GRENADA Intersection
T14 via the BRUTE1.4GT transition? (Fig. 89)

1- 61 NM
2- 57 NM
3- 53 NM
4- 51 NM

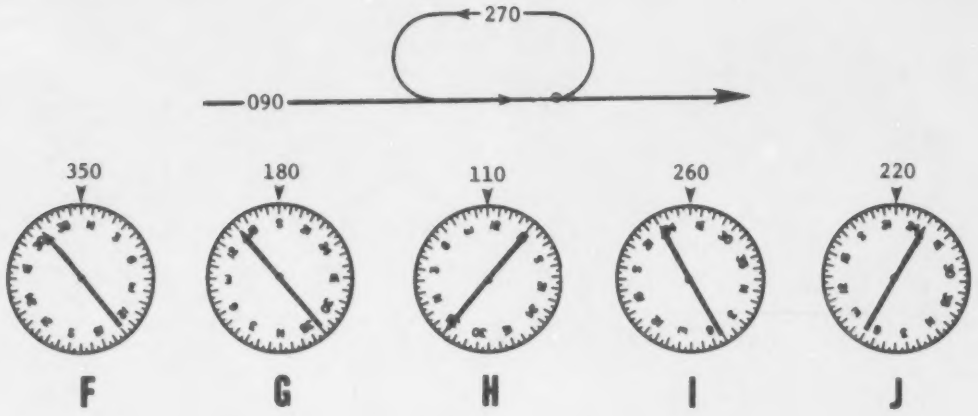


Figure 90

868. What maximum indicated Mach or KIAS does ATC expect you to maintain to
T27 ensure proper airspace protection when holding in turbulent air conditions?

1- Mach .80 or 300 KIAS, whichever is higher.
2- Mach .80 or 280 KIAS, whichever is lower.
3- Mach .78 or 270 KIAS, whichever is lower.
4- Mach .75 or 280 KIAS, whichever is higher.

869. You observe the indications as shown in J as you arrive over
T27 the NDB. Which holding pattern entry procedure should you plan to use after station passage? (Fig. 90)

1- Parallel or teardrop
2- Parallel only
3- Direct only
4- Teardrop only

870. You observe the indications as shown in I as you arrive over
T27 the NDB. Which holding pattern entry procedure should you plan to use after station passage? (Fig. 90)

1- Teardrop only
2- Direct only
3- Parallel only
4- Parallel or teardrop

871. You observe the indications as shown in H as you arrive over the NDB. Which
T27 holding pattern entry procedure should you plan to use after station passage? (Fig. 90)

1- Direct only
2- Teardrop only
3- Teardrop or parallel
4- Parallel only

872. You observe the indications as shown in G as you arrive over the NDB. Which
T27 holding pattern entry procedure should you plan to use after station passage? (Fig. 90)

1- Teardrop only
2- Parallel only
3- Direct only
4- Direct or parallel

873. You observe the indications as shown in F as you arrive over the NDB. Which
T27 holding pattern entry procedure should you plan to use after station passage? (Fig. 90)

1- Parallel only
2- Teardrop or direct
3- Direct only
4- Teardrop only

874. Turbulence which, when less than 1/3 of the time, causes slight, rapid,
V34 and somewhat rhythmic bumpiness without appreciable changes in altitude or attitude should be reported as

1- occasional light chop.
2- intermittent light chop.
3- moderate turbulence.
4- moderate chop.

875. Assume that thrust is managed to maintain IAS, and glide slope is
Z17 being flown. What characteristics should be observed when a tailwind shears to a constant headwind?

1- PITCH ATTITUDE: Decreases;
REQUIRED THRUST: Reduced, then increased;
VERTICAL SPEED: Increases;
IAS: Decreases, then increases to approach speed.

2- PITCH ATTITUDE: Increases;
REQUIRED THRUST: Increased, then reduced;
VERTICAL SPEED: Decreases;
IAS: Increases, then decreases to approach speed.

3- PITCH ATTITUDE: Decreases;
REQUIRED THRUST: Increased, then reduced;
VERTICAL SPEED: Decreases;
IAS: Decreases, then increases to approach speed.

4- PITCH ATTITUDE: Increases;
REQUIRED THRUST: Reduced, then increased;
VERTICAL SPEED: Decreases;
IAS: Increases, then decreases to approach speed.

876. At what distance from the landing runway threshold does the touchdown
R24 zone marker begin?

1- 500 feet
2- 800 feet
3- 1,000 feet
4- 1,200 feet

877. The minimum en route altitude for a segment of a jet airway, unless
R32 otherwise specified on the Enroute High Altitude Chart, is

1- 24,000 feet MSL.
2- 18,000 feet MSL.
3- 14,500 feet MSL.
4- 14,000 feet MSL.

878. What does this symbol (▽) indicate when it appears on an instrument
Q40 approach procedure chart?

1- Takeoff minimums are standard, 1/2 statute mile, for a 3-engine aircraft.
2- Takeoff minimums are non-standard and that a certain IFR departure procedure may have been established for obstruction avoidance after takeoff.
3- Takeoff minimums are non-standard only for air carrier type airplanes; consult a separate listing.
4- A SID has been published for that particular airport.

879. In determining the aircraft approach category for an instrument approach
Q36 procedure, airplane speeds are based upon 1.3 times the stalling speed of the aircraft in the

1- landing configuration at the estimated gross landing weight.
2- approach configuration at the estimated landing weight.
3- landing configuration at the maximum certificated gross landing weight.
4- approach configuration at V_{REF} at the certificated landing weight.

880. What is the maximum distance (H) class facilities (when used to define a
S26 proposed route off airways) should be apart for operations between 14,000 feet MSL and 17,999 feet MSL in the conterminous United States?

1- 260 NM
2- 200 NM
3- 180 NM
4- 130 NM

881. Turbulence which, when 2/3 of the time, momentarily causes slight, erratic
V34 changes in altitude and/or attitude (pitch, roll, yaw) should be reported as

1- occasional light chop.
2- intermittent light chop.
3- moderate chop.
4- intermittent light turbulence.

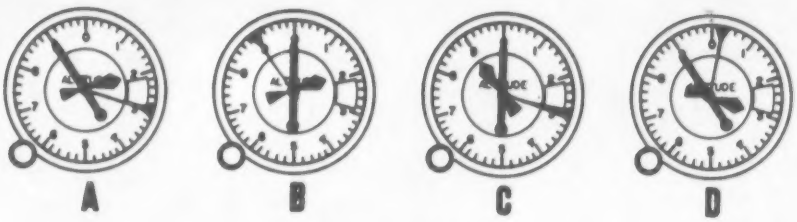


Figure 91

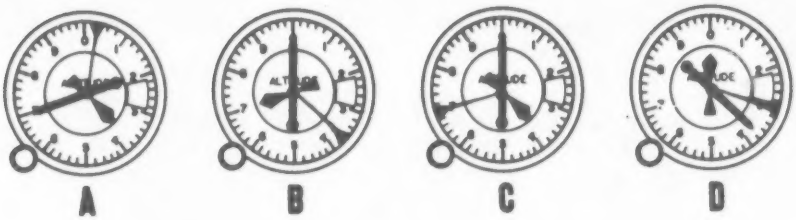


Figure 92

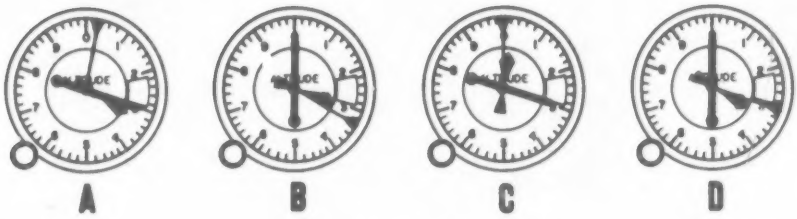


Figure 93

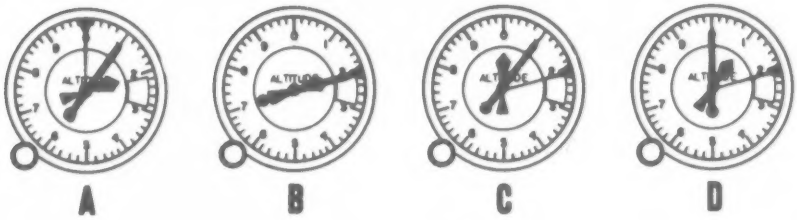


Figure 94

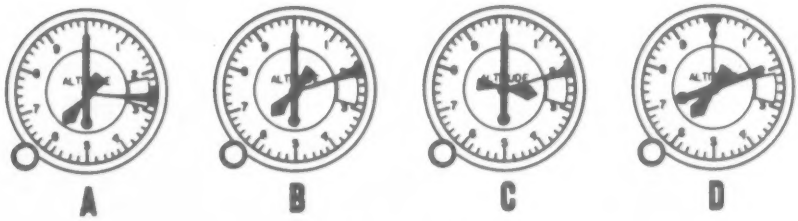


Figure 95

882. Which altitude depicted on an instrument approach chart is for emergency use only and does not necessarily ensure acceptable navigational signal coverage within a 25-mile radius of the navigation facility?
Q24

1- Minimum en route altitude
2- Minimum sector altitude
3- Minimum vectoring altitude
4- Minimum descent altitude

883. What is the lowest RA DH and visibility/RVR requirement for a Category III A instrument approach procedure?
Q40

1- DH - None; RVR - 700 feet
2- DH - 50 feet; RVR - 700 feet
3- DH - 50 feet; RVR - 1,200 feet
4- DH - 100 feet; RVR - 1,200 feet

884. Which information is necessary to determine the category of an airplane for instrument approaches?
Q36

1- The stall speed in landing configuration (at maximum certificated landing weight) and the maximum takeoff weight.
2- The stall speed in landing configuration (at maximum certificated gross landing weight) and the maximum certificated landing weight.
3- The minimum steady flight speed at which the airplane is controllable and the actual landing weight.
4- The minimum steady flight speed at which the airplane is controllable and the actual takeoff weight.

885. You enter holding at 1800Z and receive an EAC time of 1814Z. At 1802Z, you experience complete two-way communications failure. (The holding fix is not the same as the approach fix.) Which procedure should you follow to execute the approach to a landing?
V12

1- Depart the holding fix at the EAC time, and complete the approach.
2- Depart the holding fix to arrive at the approach fix as close as possible to the EAC time and complete the approach.
3- Depart the holding fix on the flight planned ETA (as amended with ATC); proceed to the approach fix for the procedure in use.
4- Proceed to the approach fix, hold until EAC time, and complete the approach.

886. At what distance from the landing runway threshold does the fixed distance marker begin?
R24

1- 2,000 feet
2- 1,000 feet
3- 500 feet
4- 250 feet

887. You experience a right crosswind component while arcing left on the 15 DME arc. Where should the bearing pointer be referenced relative to the wingtip position to maintain the 15 DME range?
Z14

1- Ahead of the right wingtip reference.
2- Behind the left wingtip reference.
3- On the left wingtip reference.
4- Ahead of the left wingtip reference.

888. Which altimeter correctly depicts FL 290? (Fig. 91)
Z15

1- A
2- B
3- C
4- D

889. Which altimeter correctly depicts FL 370? (Fig. 92)
Z15

1- A
2- B
3- C
4- D

890. Which altimeter correctly depicts FL 330? (Fig. 93)
Z15

1- A
2- B
3- C
4- D

891. Which altimeter correctly depicts FL 210? (Fig. 94)
Z15

1- A
2- B
3- C
4- D

892. Which illustration correctly depicts FL 260? (Fig. 95)
Z15

1- A
2- B
3- C
4- D

893. What operational consideration normally applies to a SID clearance?
T14

1- ATC will not issue a SID clearance to any aircraft departing VFR on an IFR flight plan.
2- A SID clearance will not be issued to an air carrier IFR flight unless the pilot in command specifically requests it.
3- The pilot in command of an air carrier airplane may either accept or decline a SID clearance.
4- An air carrier pilot must accept a SID clearance issued by ATC.

894. How does the wake turbulence vortex circulate around each wingtip?
V35

1- Inward, upward, and around each tip.
2- Clockwise as viewed from behind.
3- Inward, upward, and counterclockwise.
4- Outward, upward, and around each tip.

895. An abbreviated departure clearance, "cleared as filed," will always contain the
T11

1- name of the first compulsory reporting point.
2- assigned cruising altitude.
3- name of destination airport to which cleared.
4- name of each location where the route changes airways.

896. Which airspace is defined as a Transition Area when designated in conjunction with an airport which has a published instrument approach procedure?
R32

1- Where specified, that airspace extending upward from 700 feet or more AGL and terminating at the base of the overlying controlled airspace.
2- That airspace which extends from the surface and terminates at the base of the overlying CCA.
3- The airspace extending from the surface to 3,000 feet within a 5-statute mile radius of the airport.
4- Areas designated as Group I or Group II TCAs for which all aircraft are subject to the operating rules in FAR Part 91.

897. The lowest defined category II decision height in terms of HAT is
Q40

1- 50 feet.
2- 100 feet.
3- 150 feet.
4- 175 feet.

898. On a direct flight off established airways, what is the maximum distance
S26 between (H) class navigation aids that may be used to ensure adequate signal reception for a flight at FL 450?

1- 260 NM
2- 200 NM
3- 150 NM
4- 130 NM

899. At 1630Z, you enter a holding pattern and receive an EAC time of 1650Z. At 1635Z,
V12 complete two-way communications failure occurs. If the holding fix is not the same as the approach fix, what is the recommended procedure ATC expects you to follow to execute the instrument approach to a landing?

1- Proceed to the approach fix, hold until the EAC time, and complete the approach.
2- Depart the holding fix on the flight planned ETA (as amended with ATC), proceed to the approach fix, and complete the approach.
3- Depart the holding fix to arrive at the approach fix as close as possible to the EAC time and complete the approach.
4- Depart the holding fix at the EAC time, and complete the approach.

900. For an IFR flight to be cleared for a visual approach, what approach and
U19 landing minimum must prevail?

1- 1,000-foot ceiling and 1-mile visibility.
2- Basic VFR conditions (VMC).
3- The same minimums as the IFR approach to that runway.
4- Ceiling which permits at least a 1,000-foot obstacle clearance.

901. How often is NOTAM (D) data given all-circuit dissemination?
R10

1- Every 12 hours (NOSUM)
2- Every 6 hours
3- Every 2 hours
4- Hourly

902. A certain airplane has a nosewheel tire pressure of 55 PSI and the main
Z16 wheel's tire pressures are 135 PSI. What is the relationship, if any, between tire pressure and dynamic hydroplaning?

1- Hydroplaning would occur only on the nose wheel tire with these tire pressures.
2- The main wheel tires would hydroplane before the nose wheel tire.
3- The nose wheel tire would hydroplane before the main wheel tires.
4- Speed only, and not tire pressure, determines when dynamic hydroplaning would occur.

903. To what airspace is a RNAV high route confined?
T23

1- 18,000 feet MSL to FL 450.
2- FL 240 to FL 450.
3- FL 240 to FL 600.
4- FL 310 to FL 600.

904. Assume that thrust is managed to maintain IAS, and glide slope is
Z17 being flown. What characteristics should be observed when a constant tailwind shears to a constant headwind?

1- PITCH ATTITUDE: Increases;
REQUIRED THRUST: Reduced, then increased;
VERTICAL SPEED: Increases;
IAS: Increases, then decreases to approach speed.

2- PITCH ATTITUDE: Decreases;
REQUIRED THRUST: Reduced, then increased;
VERTICAL SPEED: Increases;
IAS: Decreases, then increases to approach speed.

3- PITCH ATTITUDE: Increases;
REQUIRED THRUST: Reduced, then increased;
VERTICAL SPEED: Decreases;
IAS: Increases, then decreases to approach speed.

4- PITCH ATTITUDE: Decreases;
REQUIRED THRUST: Increased, then reduced;
VERTICAL SPEED: Decreases;
IAS: Decreases, then increases to approach speed.

905. Which NOTAM is considered regulatory in nature and provides information such as
R10 changes to a decision height or minimum descent altitude for a particular published instrument approach procedure?

1- NOTAM (L)
2- NOTAM (R)
3- FDC NOTAM
4- NOTAM (D)

906. Of the three methods used to disseminate aeronautical information concerning the
R10 National Airspace System, which is considered to be the primary method?

1- Flight Service Stations and ARTCCs.
2- The Aeronautical Charts.
3- The Airman's Information Manual.
4- The NOTAM system.

907. Assume that thrust is managed to maintain IAS, and glide slope is being
Z17 flown. What characteristics should be observed when a constant headwind shears to a constant tailwind?

1- PITCH ATTITUDE: Decreases;
REQUIRED THRUST: Increased, then reduced;
VERTICAL SPEED: Increases;
IAS: Decreases, then increases to approach speed.

2- PITCH ATTITUDE: Increases;
REQUIRED THRUST: Reduced, then increased;
VERTICAL SPEED: Decreases;
IAS: Decreases, then increases to approach speed.

3- PITCH ATTITUDE: Decreases;
REQUIRED THRUST: Reduced, then increased;
VERTICAL SPEED: Increases;
IAS: Decreases.

4- PITCH ATTITUDE: Increases;
REQUIRED THRUST: Increased, then reduced;
VERTICAL SPEED: Increases;
IAS: Increases, then decreases to approach speed.

908. At what distance from the landing runway threshold does the touchdown zone
R24 marker begin?

1- 500 feet
2- 800 feet
3- 1,000 feet
4- 1,200 feet

909. Which NOTAM disseminates data of a "time-critical" nature that affects
R10 flight safety and is given all-circuit coverage?

1- AIRAD
2- NOTAM (D)
3- FDC NOTAM
4- NOTAM (L)

910. You experience a right crosswind component while arcing right on
Z14 the 15 DME arc. Where should the bearing pointer be referenced relative to the wingtip position to maintain the 15 DME range?

1- On the right wingtip reference.
2- Behind the right wingtip reference.
3- Ahead of the right wingtip reference.
4- Behind the left wingtip reference.

911. What is the speed and weight combination used to determine aircraft
Q36 approach categories?

1- 1.3 times the stalling speed in approach configuration at maximum certificated gross weight.
2- 1.3 times the stalling speed in landing configuration at maximum certificated gross landing weight.
3- Stalling speed in landing configuration at maximum certificated gross weight.
4- Stalling speed in approach configuration at maximum certificated landing weight.

912. What is the lowest RA DH, if any, for a Category III A instrument approach
Q40 procedure?

1- No DH is provided.
2- 50 feet.
3- 100 feet.
4- 150 feet.

913. If severe turbulence should be encountered, a pilot should make the neces-
Z19 sary power adjustments and attempt to maintain

1- a constant airspeed.
2- a level flight attitude.
3- both a constant airspeed and altitude.
4- a constant altitude.

914. What is an Airport Advisory Area?

R34
1- That airspace within 5 statute miles of an airport which does not have a control tower but where an FSS is located.
2- That airspace identified by an area on the surface within which flight of an aircraft is subject to special restrictions.
3- The airspace which extends upward from the surface and terminates at the base of the Continental Control Area (CCA).
4- That airspace within 5 statute miles of an airport, extending up to but not including 3,000 feet, within which a control tower is in operation.

915. For a given airplane gross weight at a constant Mach .82 cruise, what is the
Z17 relationship between fuel flow, temperature, and altitude? Fuel flow is higher when

1- both temperature and altitude are decreased.
2- temperature is decreased and altitude is increased.
3- both temperature and altitude are increased.
4- temperature is increased and altitude is decreased.

"CLEARED AS FILED. MAINTAIN SEVEN THOUSAND, EXPECT FLIGHT LEVEL TWO FIVE ZERO FIVE MINUTES AFTER DEPARTURE. MAINTAIN RUNWAY HEADING FOR RADAR VECTOR TO JOIN J37. SQUAWK 0105...." (ATL weather is 100 obscured and one-half mile in fog.)

916. You depart RWY 27R at William B. Hartsfield International after receiving
V12 the above clearance and experience complete two-way communications failure. The course of action ATC expects you to take is to

1- turn immediately to intercept J37. At 5 minutes after departure, climb to your flight planned altitude.
2- maintain runway heading for 5 minutes, then turn to intercept J37 and climb to FL 250.
3- turn immediately to intercept J37, and climb to FL 250 5 minutes after departure.
4- maintain runway heading until reaching 7,000 feet MSL, then turn to intercept J37 and climb to FL 250.

917. ATC issues you a clearance for a "Contact Approach" while operating
U20 within the Los Angeles TCA. This clearance

1- is authorization to descend below the floor of the TCA if you are in radar contact with approach control.
2- authorizes you to descend below the floor of the TCA provided you are over a specific VFR checkpoint.
3- authorizes you to descend below the floor of the TCA if you are VFR.
4- does not authorize you to descend below the floor of the TCA.

918. Information concerning changes that affect the en route structure and
R10 published instrument approach procedures is disseminated as a

1- NOTAM (L).
2- FDC NOTAM.
3- NOTAM (R).
4- NOTAM (D).

919. The vertical extent of the Positive Control Area throughout the conter-
R32 minous United States is from

1- 14,500 feet to FL 450.
2- 18,000 feet to FL 450.
3- 18,000 feet to FL 600.
4- FL 240 to FL 600.

920. What is the normally expected service range of an (H) class navigational
R13 aid for a proposed flight at FL 350?

1- 130 NM
2- 120 NM
3- 110 NM
4- 100 NM

921. Of what initial cockpit indications should a pilot be aware when a
Z17 constant headwind component shears to a calm wind?

1- IAS decreases, aircraft pitches up, and altitude decreases.
2- IAS decreases, aircraft pitches down, and altitude decreases.
3- IAS increases, aircraft pitches up, and altitude increases.
4- IAS increases, aircraft pitches down, and altitude increases.

922. Which NOTAM data are appended to the hourly Aviation Weather Report (SA)
R10 for a particular station?

1- FDC NOTAM
2- AIRAD
3- NOTAM (L)
4- NOTAM (D)

923. Which NOTAM is considered regulatory in nature?
R10

1- NOTAM (D)
2- NOTAM (R)
3- FDC NOTAM
4- NOTAM (L)

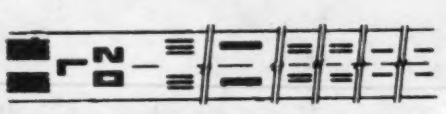
924. Of what initial cockpit indications should a pilot be aware when a constant
Z17 tailwind component shears to a calm wind?

1- Altitude increases; pitch and indicated airspeed decrease.
2- Altitude, pitch, and indicated airspeed decrease.
3- Altitude, pitch, and indicated airspeed increase.
4- Altitude decreases; pitch and indicated airspeed increase.

925. When using an airplane with VORTAC three-dimensional area navigation
Z13 equipment,

1- continuous vertical guidance to end of runway with selectable glide slope capability is available.
2- the airplane must be equipped with a transponder in order to file an IFR flight plan using area navigation.
3- all VORs along the major airways may be used to set up waypoints.
4- it is the responsibility of the pilot to select the waypoints on an established RNAV route.

926. The distance from the approach end of the runway to the touchdown zone mark-
R24 ing is



1- 2,000 feet.
2- 1,500 feet.
3- 1,000 feet.
4- 500 feet.

927. Vortex circulation around the wingtips is
V35

1- counterclockwise as viewed from behind.
2- clockwise as viewed from behind.
3- inward, upward, and around each tip.
4- outward, upward, and around each tip.

928. Which NOTAM data are disseminated by operating control towers, telautograph,
R10 and telephone?

1- NOTAM (D)
2- FDC NOTAM
3- AIRAD
4- NOTAM (L)

929. At 1430Z, you enter a holding pattern and receive an EAC time of 1450Z. At
V12 1435Z, complete two-way communications failure occurs. If the holding fix is not the same as the approach fix, what is the recommended procedure ATC expects you to follow to execute the instrument approach to a landing?

1- Proceed to the approach fix, hold until the EAC time, and complete the approach.
2- Depart the holding fix to arrive at the approach fix as close as possible to the EAC time and complete the approach.
3- Depart the holding fix at the EAC time, and complete the approach.
4- Depart the holding fix on the flight planned ETA (as amended with ATC), proceed to the approach fix and complete the approach.

930. What is an airport traffic area?

R34
1- The airspace identified by an area on the surface within which flight of an aircraft is subject to restrictions.
2- That airspace which extends upward from the surface and terminates at the base of the Continental Control Area.
3- That airspace extending upward to, but not including 3,000 feet, within a 5-statute mile radius from the center of an airport which has an operating control tower.
4- That airspace within 5 statute miles of an airport which does not have a control tower but where an FSS is located.

931. What is the lowest RA DH and visibility/RVR requirement for a Category III A
Q40 instrument approach procedure?

1- DH - None; RVR - 700 feet
2- DH - 50 feet; RVR - 700 feet
3- DH - 50 feet; RVR - 1,200 feet
4- DH - 100 feet; RVR - 1,200 feet

932. To determine which instrument approach category minimums are applicable to a
Q36 turbojet airplane, you must know the

1- V_A at maximum certificated landing weight.
2- number of engines and stall speed at the anticipated landing weight.
3- V_{SO} at maximum certificated gross landing weight.
4- V_{SO} at maximum certificated takeoff weight.

933. As compared to a wind down the landing runway, what effect would a light
V35 crosswind of approximately 7 knots have on wingtip vortex behavior?

1- Both vortices would move downwind at a greater rate than if the surface wind was directly down the landing runway.
2- The upwind vortex would tend to remain in the touchdown zone longer than the downwind vortex.
3- A light crosswind would rapidly dissipate the strength of both vortices.
4- The downwind vortex would tend to remain in the touchdown zone longer than the upwind vortex.

934. What is the purpose of FDC NOTAMs?

R10
1- To provide all information considered essential to flight safety in one publication.
2- To advise of changes, regulatory in nature, to instrument approach procedures prior to their normal publication cycle.
3- To provide the latest information on the status of navigation facilities to all FSS facilities for scheduled broadcasts.
4- To issue notices for all airports and navigation facilities in the shortest possible time.

935. What altitude, when depicted on an Enroute Low Altitude Chart, ensures
Q24 acceptable navigational signal coverage for accurate navigation only within 2 nautical miles of a VOR/ VORTAC?

1- MRA
2- MCA
3- MOCA
4- MEA

936. What does this symbol (▽) indicate when it appears on an instru-
Q40 ment approach procedure chart?

1- Takeoff minimums are non-standard and a certain IFR departure may have been established for obstruction avoidance after takeoff.
2- Takeoff minimums are non-standard only for air carrier operation; consult a separate listing.
3- Takeoff minimums are standard for aircraft with three or more engines.
4- A SID has been published for that airport.

937. What is the lowest defined CAT II DH in terms of HAT?
Q40

1- 50 feet
2- 100 feet
3- 150 feet
4- 200 feet

"CLEARED AS FILED, MAINTAIN EIGHT THOUSAND, EXPECT FLIGHT LEVEL TWO FOUR ZERO FIVE MINUTES AFTER DEPARTURE. MAINTAIN RUNWAY HEADING FOR RADAR VECTOR TO JOIN J26...."

938. You depart RWY 32R at Chicago-O'Hare International Airport after receiving
V12 the above clearance and immediately experience complete two-way communications failure. The course of action ATC expects you to take is to

1- turn immediately to intercept J26. Five minutes after departure, climb to your flight planned altitude.
2- maintain runway heading for 5 minutes, then turn to intercept J26, and climb to FL 240.
3- turn immediately to intercept J26, climb to FL 240 5 minutes after departure.
4- maintain runway heading until reaching 8,000, then turn to intercept J26, and climb to FL 240.

939. What aural and visual indications should be received when over the back course
R14 marker on a published back course ILS?

1- Continuous dots at the rate of six dots per second--blue light.
2- Two dots at the rate of 72 to 95 two-dot combinations per minute--amber light.
3- Continuous dots at the rate of 2 dots per second--white light.
4- Two dots at the rate of 72 to 95 two-dot combinations per minute--white light.

940. What is the lowest RA DH, if any, and the visibility/RVR requirement for a
Q40 Category III B instrument approach procedure?

1- DH - None; RVR - 150 feet
2- DH - 50 feet; RVR - None
3- DH - 50 feet; RVR - 150 feet
4- DH - 50 feet; RVR - 700 feet

941. When are data contained in a NOTAM (L) disseminated?
R10

1- Hourly in the NOTAM Summary (NOSUM).
2- Hourly, appended to the local Aviation Weather Report (SA).
3- As requested by pilots or on an "as needed" basis when departing, en route, or landing.
4- Twice each day in the NOTAM Summary (NOSUM).

942. At what distance from the landing run-way threshold does the touchdown zone
R24 marker begin?

1- 500 feet
2- 1,000 feet
3- 1,200 feet
4- 1,500 feet

943. What visual and aural indications should be received when over the back course
R14 marker on a published back course ILS?

1- Amber light--two dots at the rate of 72 to 95 two-dot combinations per minute.
2- Blue light--continuous dots at the rate of six dots per second.
3- Amber light--continuous dots at the rate of six dots per second.
4- White light--two dots at the rate of 72 to 95 two-dot combinations per minute.

944. When passing through an abrupt wind shear which involves a shift from a
Z17 tailwind to a headwind, what power management would normally be required to maintain a constant indicated airspeed and ILS glide slope?

1- Higher than normal power initially, followed by a decrease as the shear is encountered, then an increase.
2- Lower than normal power initially, followed by an increase as the shear is encountered, then a decrease.
3- Higher than normal power initially, followed by a further increase as the wind shear is encountered, then a decrease.
4- Lower than normal power initially, followed by a further decrease as the shear wind is encountered, then an increase.

945. To what airspace is a RNAV low route confined?
T23

1- From 1,200 feet AGL up to, but not including, 10,000 feet MSL.
2- From 1,200 feet AGL up to, but not including, 18,000 feet MSL.
3- From 10,000 feet MSL up to, but not including, 18,000 feet MSL.
4- From 10,000 feet MSL up to, but not including, FL 240.

946. At approximately what speed should you expect dynamic hydroplaning to occur
Z16 if a tire has an air pressure of 135 PSI?

1- 112 to 115 knots
2- 105 to 110 knots
3- 98 to 102 knots
4- 86 to 90 knots

947. What is critical Mach number? It is the

Z18 1- speed at which the aircraft starts to "buffet" or "tuck."
2- speed where the airflow over the wing is completely supersonic.
3- highest speed possible without supersonic airflow over any part of the wing
4- same for all high altitude aircraft.

948. What is the operational status of a VOR/VORTAC if you receive only the
R12 coded identifier approximately every 30 seconds?

1- Maintenance is being performed and that neither the VOR nor DME is operating normally.
2- Both the VOR and DME signals are operating normally.
3- The VOR is inoperative; the DME is operating normally.
4- The DME is inoperative; the VOR is operating normally.

949. Unless determined otherwise through flight inspection procedures, what is
R13 the normal expected service range of an (L) class navigation aid as it appears on an Enroute Low Altitude Chart?

1- 40 NM
2- 30 NM
3- 20 NM
4- 10 NM

950. What visual and aural indications should be received when over the back course
R14 marker on a published back course ILS?

1- Blue light--continuous dots at the rate of six dots per second.
2- Amber light--two dots at the rate of 72 to 95 two-dot combinations per minute.
3- White light--two dots at the rate of 72 to 95 two-dot combinations per minute.
4- Amber light--continuous dots at the rate of six dots per second.

951. Which quality is representative of the wake turbulence produced by a large
V35 transport aircraft?

1- Induced roll within vortices will not exceed the rolling capabilities of modern, short span, high performance aircraft.
2- Vortices can be avoided by remaining at least 300 feet below and behind the flight path of the generating aircraft.
3- The vortex characteristics of any given aircraft may be altered by extending the wing flaps or changing the speed.
4- Wake turbulence behind a propeller driven aircraft is negligible since jet engine thrust is a necessary factor in the formation of vortices.

952. Which condition would initially cause the IAS and pitch to increase and the
Z17 aircraft to gain altitude?

1- Sudden decrease in a headwind component.
2- Tailwind which suddenly increases in velocity.
3- Sudden increase in a headwind component.
4- Tailwind which shears to a calm wind.

953. In terms of HAT, what is the lowest defined CAT II DH?
Q40

1- 200 feet
2- 150 feet
3- 100 feet
4- 50 feet

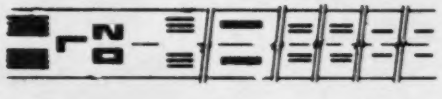
954. What is one important difference between the simplified directional
R16 facility (SDF) and the ILS localizer? The SDF

1- coded identification consists of a two-letter identifier.
2- has a wider course resulting in less precision.
3- utilizes a lower frequency band.
4- range information is provided by DME.

955. When cleared to execute a published side-step maneuver for a specific
U21 approach and subsequent landing, at what point is the pilot expected to commence this maneuver?

1- At the published ASR minimums.
2- At the published minimum altitude for a circling approach.
3- As soon as possible after the runway or runway environment is in sight.
4- At the DH for the straight-in approach.

956. The distance from the approach end of the runway to the touchdown zone mark-
R24 ing is



1- 500 feet.
2- 800 feet.
3- 1,000 feet.
4- 1,500 feet.

957. Which altitude, when shown on an Enroute Low Altitude or Area Chart, ensures
Q24 acceptable navigational signal reception by which an accurate determination of position can be made at a specified intersection?

1- MOCA
2- MRA
3- MCA
4- MEA

958. What is the relationship between fuel flow, temperature, and altitude for
Z17 a given airplane gross weight at a constant indicated cruise Mach?

1- Fuel flow is higher when both temperature and altitude are increased.
2- Fuel flow is lower when temperature is decreased and altitude is increased.
3- Fuel flow is higher when temperature is decreased and altitude is increased.
4- Fuel flow is lower when both temperature and altitude are decreased.

959. Which altitude, when depicted on an Enroute Low Altitude or Area Chart,
Q24 ensures acceptable signal coverage for accurate navigation only within 25 statute miles of a VOR/VORTAC?

1- MRA
2- MEA
3- MOCA
4- MCA

960. What is the lowest RA DH, if any, and the visibility/RVR requirement for a
Q40 Category III B instrument approach procedure?

1- DH - None; RVR - 700 feet
2- DH - None; RVR - 150 feet
3- DH - 100 feet; RVR - 1,000 feet
4- DH - 50 feet; RVR - 700 feet

961. What approach and landing minimums must prevail for an IFR flight cleared
U19 for a visual approach?

1- 1,000-foot ceiling and 1-mile visibility.
2- The same minimums as the IFR approach to that runway.
3- Basic VFR conditions (VMC).
4- Ceiling which permits at least a 1,000-foot obstacle clearance.

962. Assume that thrust is managed to maintain IAS, and glide slope is being
Z17 flown. What characteristics should be observed when constant headwind shears to a constant tailwind?

1- PITCH ATTITUDE: Decreases;
REQUIRED THRUST: Increased, then reduced;
VERTICAL SPEED: Increases;
IAS: Decreases, then increases to approach speed.

2- PITCH ATTITUDE: Increases;
REQUIRED THRUST: Increased, then reduced;
VERTICAL SPEED: Decreases;
IAS: Increases, then decreases to approach speed.

3- PITCH ATTITUDE: Decreases;
REQUIRED THRUST: Reduced, then increased;
VERTICAL SPEED: Increases;
IAS: Decreases and remains at that value.

4- PITCH ATTITUDE: Increases;
REQUIRED THRUST: Reduced, then increased;
VERTICAL SPEED: Decreases;
IAS: Decreases, then increases to approach speed.

963. What ATC clearance information will always be contained in an abbreviated
T11 departure clearance, "CLEARED AS FILED...."?

1- The name of the first point where the route changes airways.
2- The name of the destination airport to which the flight is cleared.
3- The name of the first compulsory reporting point if not in radar environment.
4- The cruising altitude as assigned by ATC.

964. Which category of NOTAM data are issued in accordance with Federal
R10 Aviation Regulations and are considered regulatory?

1- NOTAM (L)
2- FDC NOTAM
3- NOTAM (L) and NOTAM (D)
4- NOTAM (D)

965. NOTAM data which are disseminated locally by telautograph or telephone
R10 are categorized as a

1- NOTAM advisory (AIRAD).
2- NOTAM (L).
3- NOTAM (D).
4- FDC NOTAM.

966. What is the lowest RA DH and visibility/RVR requirement for a Category III A
Q40 instrument approach procedure?

1- DH - None; RVR - 700 feet
2- DH - 100 feet; RVR - 1,200 feet
3- DH - 50 feet; RVR - 700 feet
4- DH - None; RVR - 150 feet

967. While arcing left on the 15 DME arc, you experience a left crosswind component.
Z14 Where should the bearing pointer be referenced relative to the wingtip position to maintain the 15 DME range?

1- On the left wingtip reference.
2- Ahead of the right wingtip reference.
3- Behind the left wingtip reference.
4- Ahead of the left wingtip reference.

968. What determines the instrument approach category (A, B, C, D, or E) for an air
Q36 carrier airplane?

1- The maximum gross weight and 1.3 V_{SO} in the landing configuration.
2- The gross landing weight and V_{SO} in the landing configuration.
3- The maximum certificated gross landing weight in the landing configuration and 1.3 V_{SO}.
4- The maximum certificated landing weight at 1.3 V_A.

969. Critical Mach number is the

Z18 1- speed where the airflow over the wing is completely supersonic.
2- highest speed possible without supersonic flow over any part of the aircraft.
3- same for all high altitude aircraft.
4- speed at which the aircraft starts to "buffet" or "tuck."

970. As compared to dynamic hydroplaning, at what speed can a pilot expect viscous
Z16 hydroplaning to occur when landing on a wet runway which has a smooth surface?

1- At approximately 2.0 times the speed dynamic hydroplaning can be expected to occur.
2- At lower speed dynamic hydroplaning occurs.
3- At approximately 1.5 times the speed dynamic hydroplaning can be expected to occur.
4- At the same speed dynamic hydroplaning occurs.

971. When is it appropriate to request a "contact approach"?
U20

1- Only in lieu of conducting a published instrument approach procedure to an airport.
2- Only by a pilot on an IFR clearance to an airport not having a prescribed instrument approach procedure.
3- When "in the clear," following an instrument approach to one airport, a contact approach clearance should be used to proceed to another nearby airport.
4- Only when the ground visibility is at least one statute mile and the airfield environment is in sight.

"CLEARED AS FILED, MAINTAIN EIGHT THOUSAND, EXPECT FLIGHT LEVEL TWO FOUR ZERO FIVE MINUTES AFTER DEPARTURE. MAINTAIN RUNWAY HEADING FOR RADAR VECTOR TO JOIN J26...."

972. You depart RWY 32R at Chicago-O'Hare International Airport after receiving
V12 the above clearance and immediately experience complete two-way communications failure. The course of action ATC expects you to take is to

1- maintain runway heading until reaching 8,000, then turn to intercept J26, and climb to FL 240.
2- turn immediately to intercept J26. Five minutes after departure, climb to your flight planned altitude.
3- maintain runway heading for 5 minutes, then turn to intercept J26, and climb to FL 240.
4- turn immediately to intercept J26, climb to FL 240 5 minutes after departure.

973. On an Enroute Low Altitude Chart, which altitude ensures acceptable navigational
Q24 signal reception by which an accurate determination of position can be made at a specified intersection?

1- MRA
2- MCA
3- MEA
4- MOCA

974. If a tire has an air pressure of 145 PSI, at approximately what speed should you
Z16 expect dynamic hydroplaning to occur?

1- 114 to 118 knots
2- 108 to 112 knots
3- 102 to 106 knots
4- 96 to 100 knots

975. An abbreviated departure clearance, "cleared as filed," will always con-
T11 tain the

1- name of the first compulsory reporting point.
2- assigned cruising altitude.
3- name of destination airport to which cleared.
4- name of each location where the route changes airways.

976. As compared to dynamic hydroplaning, at what speed can a pilot expect viscous
Z16 hydroplaning to occur when landing on a wet runway which has a smooth surface?

1- At approximately 1.5 times the speed dynamic hydroplaning can be expected to occur.
2- At lower speed dynamic hydroplaning occurs.
3- At approximately 2.0 times the speed dynamic hydroplaning can be expected to occur.
4- At the same speed dynamic hydroplaning occurs.

977. While arcing right on the 15 DME arc, you experience a left crosswind
Z14 component. Where should the bearing pointer be referenced relative to the wingtip position to maintain the 15 DME range?

1- Behind the right wingtip reference.
2- On the right wingtip reference.
3- Behind the left wingtip reference.
4- Ahead of the right wingtip reference.

978. What is the lowest RA DH and visibility/RVR requirement for a Category
Q40 III A instrument approach procedure?

1- DH - 50 feet; RVR - 700 feet
2- DH - None; RVR - 700 feet
3- DH - None; RVR - 150 feet
4- DH - 100 feet; RVR - 1,200 feet

979. An abbreviated departure clearance "...CLEARED AS FILED...." will always
T11 contain the

1- cruising altitude as requested on the flight plan.
2- name of the destination airport to which cleared.
3- name and number of the SID to be flown when filed in the flight plan.
4- name of the first compulsory reporting point if not in radar environment.

980. That segment of an instrument approach procedure between the intermediate fix,
Q24 or point, and the final approach fix is called the

1- step-down fix.
2- maneuvering segment.
3- initial approach.
4- intermediate approach.

LEGEND
INSTRUMENT APPROACH PROCEDURES (CHARTS)

PLANVIEW SYMBOLS

Procedural Track

165°
345°
Procedure Turn
(45° off course bearing for select users-degree and point of turn is left to discretion of pilot)

Missed Approach

Visual Flight Path

HOLDING PATTERNS

270°
090°
In lieu of Procedure Turn

270°
090°
Arrival Holding Pattern

Missed Approach Holding

Limits will only be specified when they deviate from the standard. DME Fixes may be shown.

Helicopter Alighting Area

(IAF)
20 DME
6 DME
Name
TACAN Fix
TACAN/DME Fix
RNAV Fix

TERMINAL ROUTINGS

2000 Minimum Altitude
155°
(15.1) Mileage
Penetrates Special Use Airspace

3100 NoPT 5.6 NM to GS Intcpt
045°
(14.2 to LOM)

R-198
Radial line and value

LR-198
Lead Radial

1400
Minimum Sector Altitude within 25 NM (Emergency Use Only)

(Arrows on distance circle identify Sectors)

International Boundary

Distance not to scale

VOR Changeover Point

OBSTRUCTIONS

• Spot Elevation ▪ Highest Spot Elevation

Unlighted Lighted Group Unlighted

Group Lighted Highest Obstruction

± Doubtful Accuracy

SPECIAL USE AIRSPACE

R-5107
R-Restricted
P-Prohibited
W-Warning

RADIO AIDS TO NAVIGATION

110.1 Underline indicates No Voice transmitted on this frequency

VOR TACAN VORTAC

NDB (Non-directional Radio Beacon)

LOM (Compass Locator)

Marker Beacons

Localizer Course

Localizer Transmitter
(shown when localizer installation is offset from its normal position off the end of the runway)

SDF Course

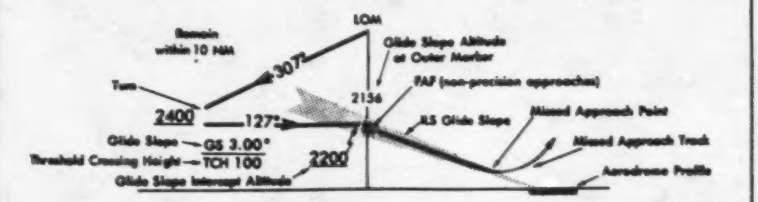
WAYPOINT (RNAV)
Waypoint Data
PRAYS
38°58.3'N 89°51.5'W
112.7 CAP 187.1°–56.2
590
Waypoint Name, Coordinates, Frequency, Identifier, Radial/Distance (Facility to Waypoint) Reference Facility Elevation.

Reporting Point
Name (Compulsory)
Name (Non-Compulsory)

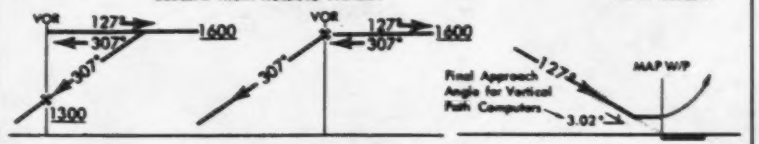
Fix or Intersection

LEGEND
INSTRUMENT APPROACH PROCEDURES (CHARTS)

PROFILE



DESCENT FROM HOLDING PATTERN



RNAV DESCENT

FACILITIES/FIXES

Z
FM
NDB (Rbn)
VOR
VORTAC
TACAN
WAYPOINT
FIX
INT

ALTITUDES

5500 Mandatory Altitude
2300 Minimum Altitude
4800 Maximum Altitude
2200 Recommended Altitude

Altitudes precede fix or are arrowed to show where they apply.

Glide Slope intercept altitude is the same as the minimum altitude over LOM for localizer only approach, except as otherwise noted.

Final Approach Fix (FAF) (for non-precision approaches)

Glide Slope Intercept

Visual Flight Path

AERODROME SKETCH

Runways

Hard Surface Other Than Hard Surface Hardstands/Taxiways

Closed Runways and Taxiways Under Construction Metal Surface

Over-run Displaced Threshold

Arresting Gear

uni-directional bi-directional Jet Barrier

Control Tower
When Control Tower and Rotating Beacon are co-located, Beacon symbol will be used and further identified as TWR.

Rotating Aerodrome Beacon.

U.S. Navy Optical Landing System (OLS) "OLS" location is shown because of its height of approximately 7 feet and proximity to edge of runway may create an obstruction for some types of aircraft.

Approach light symbols are shown on a separate legend.

Helicopter Alighting Areas

Negative Symbols used to identify Copter Procedure landing point.

Note: The prop type symbol is being phased out.

TDZE 123 Runway TDZ elevation

0.8% – up Total Runway Gradient
(shown when runway gradient exceeds 0.3%)

MINIMA DATA

▲ Indicates other than standard Alternate Minimums apply for U.S. Army and Civil, refer to tabulation.

▲NA Indicates IFR minimums are Not Authorized for alternate use due to unmonitored facility or absence of weather reporting service.

▼ Indicates other than standard Take-off Minimums or departure procedures apply for Civil users. DOD users refer to Service Directives.

Night minimums shown in negative form being phased out.
Charts converted to TERPs criteria will show night minimum when different than day by an asterisk and note.

LEGEND

INSTRUMENT APPROACH PROCEDURES (CHARTS)

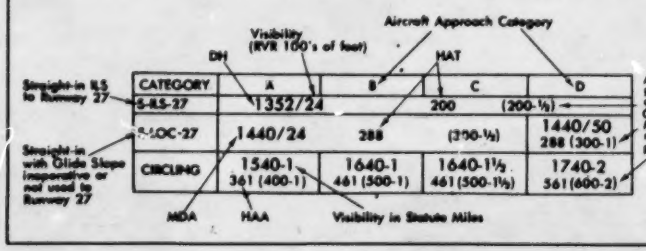
GENERAL INFORMATION & ABBREVIATIONS

* Indicates control tower operates non-continuously.
All distances in nautical miles (except Visibility Data which is in statute miles and Runway Visual Range which is in hundreds of feet).
Runway dimensions in feet.
Elevations in feet Mean Sea Level.
All radials/bearings are Magnetic.

ADF	Automatic Direction Finder	MALS/R	Medium Intensity Approach Light Systems /with RAIL
ALS	Approach Light System	MAP	Missed Approach Point
APP CON	Approach Control	MDA	Minimum Descent Altitude
ARR	Arrival	MIRL	Medium Intensity Runway Lights
ASR/PAR	Published Radar Minimums at this Aerodrome.	NA	Not Authorized
ATIS	Automatic Terminal Information Service	NDB	Non-directional Radio Beacon
BC	Back Course	NoPT	No Procedure Turn Required (Procedure Turn shall not be executed without ATC clearance)
C	Circling		
CAT	Category	RA	Radio Altimeter Height
CHAN	Channel	Radar Required	Radar vectoring required for this approach
CLNC DEL	Clearance Delivery	Radar Vectoring	May be expected through any portion of the Nav Aid Approach, except final.
DH	Decision Height		
DME	Distance Measuring Equipment	RAIL	Runway Alignment Indicator Lights
DR	Dead Reckoning	RBn	Radio Beacon
ELEV	Airport Elevation	REIL	Runway End Identifier Lights
FAF	Final Approach Fix	RCLS	Runway Centerline Light System
FM	Fan Marker	RNAV	Area Navigation
GPI	Ground Point of Interception	RRL	Runway Remaining Lights
GS	Glide Slope	RTB	Return To Base
HAA	Height Above Aerodrome	Runway Touchdown Zone	First 3000' of Runway.
HAL	Height Above Landing	RVR	Runway Visual Range
HAT	Height Above Touchdown	S	Straight-in
HIRL	High Intensity Runway Lights	SALS	Short Approach Light System
IAF	Initial Approach Fix	(S) SALS/R	(Simplified) Short Approach Light System /with RAIL
ICAO	International Civil Aviation Organization	SDF	Simplified Directional Facility
Intcp	Intercept	TA	Transition Altitude
INT, INTXN	Intersection	TAC	TACAN
LDA	Localizer Type Directional Aid	TCH	Threshold Crossing Height (Height in feet Above Ground Level)
Ldg	Landing		
LIRL	Low Intensity Runway Lights	TDZ	Touchdown Zone
LDIN	Lead in Light System	TDZE	Touchdown Zone Elevation
LOC	Localizer	TDZL	Touchdown Zone Lights
LR	Lead Radial. Provides at least 2 NM (Capter 1 NM) of lead to assist in turning onto the intermediate/final course.	TLv	Transition Level
		W/P	Waypoint (RNAV)
MALS	Medium Intensity Approach Light System		

LANDING MINIMA FORMAT

In this example airport elevation is 1179, and runway touchdown zone elevation is 1152.



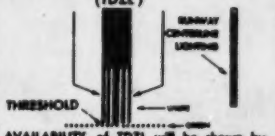
LEGEND

INSTRU[redacted] APPROACH PROCEDU[redacted] CHARTS)
APPROACH LIGHTING SYSTEMS – UNITED STATES

Each approach lighting system indicated on Airport Diagrams will bear system identification letter (A, B, etc.) indicated in legend.

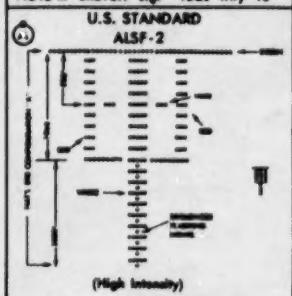
A dot "•" portrayal with approach lighting letter identifier indicates sequenced flashers (F) installed with the approach lights e.g. (A1)

TOUCHDOWN ZONE LIGHTING (TDZL)



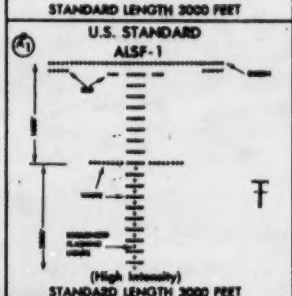
AVAILABILITY of TDZL will be shown by NOTE in SKETCH e.g. "TDZL Rwy 15"

(A1) U.S. STANDARD ALSF-2



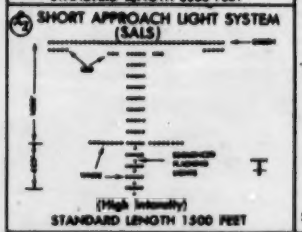
(High Intensity)
STANDARD LENGTH 3000 FEET

(A1) U.S. STANDARD ALSF-1



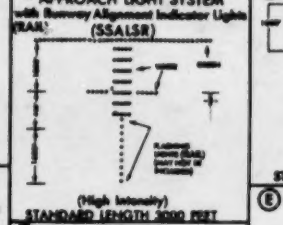
(High Intensity)
STANDARD LENGTH 3000 FEET

(A2) SHORT APPROACH LIGHT SYSTEM (SALS)



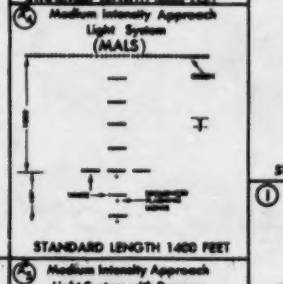
(High Intensity)
STANDARD LENGTH 1500 FEET

(A3) SIMPLIFIED SHORT APPROACH LIGHT SYSTEM with Runway Alignment Indicator Lights (RAIL) (SSALSR)



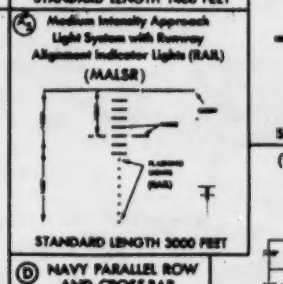
(High Intensity)
STANDARD LENGTH 3000 FEET

(A4) Medium Intensity Approach Light System (MALS)



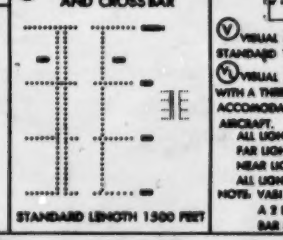
STANDARD LENGTH 1400 FEET

(A4) Medium Intensity Approach Light System with Runway Alignment Indicator Lights (RAIL) (MALSR)



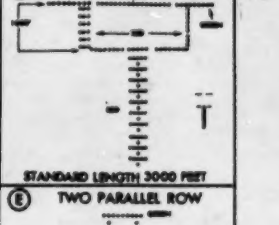
STANDARD LENGTH 3000 FEET

(A5) NAVY PARALLEL ROW AND CROSS BAR



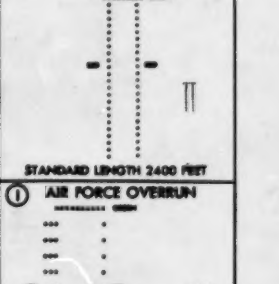
STANDARD LENGTH 1500 FEET

(B) U.S. CONFIGURATION (B)



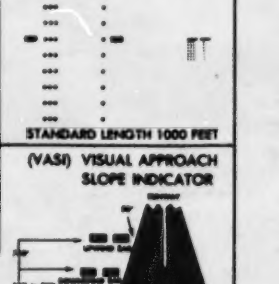
STANDARD LENGTH 3000 FEET

(E) TWO PARALLEL ROW



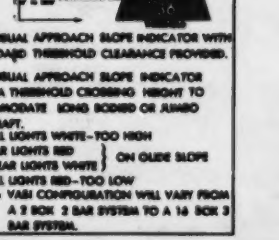
STANDARD LENGTH 2400 FEET

(I) AIR FORCE OVERRUN



STANDARD LENGTH 1000 FEET

(VASI) VISUAL APPROACH SLOPE INDICATOR



(V) VISUAL APPROACH SLOPE INDICATOR WITH STANDARD THRESHOLD CLEARANCE PROVIDED.

(VA) VISUAL APPROACH SLOPE INDICATOR WITH A THRESHOLD CROSSING HEIGHT TO ACCOMODATE LONG BODIED OR JUMBO AIRCRAFT.
ALL LIGHTS WHITE–TOO HIGH
FAR LIGHTS RED / NEAR LIGHTS WHITE } ON GLIDE SLOPE
ALL LIGHTS RED–TOO LOW

NOTE: VASI CONFIGURATION WILL VARY FROM A 2 BOX 2 BAR SYSTEM TO A 16 BOX 3 BAR SYSTEM.

LEGEND

STANDARD INSTRUMENT DEPARTURE (SID) CHARTS

RADIO AIDS TO NAVIGATION

- VOR
- TACAN
- VORTAC
- RADIO BEACON/COMPASS LOCATOR
- RANGE (Non-Simultaneous Voice)
- RANGE (Simultaneous Voice)
- MARKER BEACONS
- LOCALIZER COURSE

AERODROMES

- Helicopter

RUNWAYS

- Hardsurface
- Metal Surface
- Closed
- Under Construction
- Other Than Hard Surface
- Over-run/Hardstands/Taxiways

ROUTES

- Departure Route
- Transition Route

ALTITUDES

- 5500 — Mandatory Altitude
- 2300 — Minimum Altitude
- 4800 — Maximum Altitude
- 2200 — Recommended Altitude

SPECIAL USE AIRSPACE

R-5

R-Restricted
P-Prohibited
W-Warning
A-Alert

MISCELLANEOUS SYMBOLS

- Intersections
- Compulsory Reporting Point
- DME Fix
- R-275 — Radial line and value
- Distance Not To Scale
- Arresting Gear
- Jet Barrier
- Displaced Threshold
- Control Tower
- 0.8% DOWN — Take Off Gradient
- VOR Changeover Point
- V-25 Airway Identification

Outer Marker (OM)-continuous dashes
Middle Marker (MM)-alternate dots and dashes.
117.6-frequency underlined indicates no voice capability.
All radials/bearings are magnetic.
All mileages are nautical.
Runway dimensions in feet.
Elevation in feet-MSL.

STANDARD TERMINAL ARRIVAL ROUTE (STAR) CHARTS

RADIO AIDS TO NAVIGATION

- VOR
- TACAN
- VORTAC
- WAYPOINT (RNAV)
- RANGE (Simultaneous Broadcast)
- NDB (Non-directional Radio Beacon)
- LOM (Compass Locator)
- Marker Beacons
- Localizer Course
- SDF Course
- NAME 000.0 NAM 00 — DME or TACAN Channel
- Underline indicates no voice transmitted on this frequency
- R-275 — Radial line and value
- Reporting Point — Non-Compulsory / Compulsory
- DME Fix
- 15 — DME Mileage (when not obvious)
- VOR Changeover Point

ROUTES

- 4500 MEA
  *3500 MOCA
  270° — Arrival Route
  (65) Mileage
- Transition Route
- MCA (Minimum Crossing Altitude)
- Mileage Breakdown
- Altitude change at other than Radio Aids
- (65) Mileage between Radio Aids, Reporting Points and Route Breaks
- V12 J80 Airway/Route Identification
- Holding Pattern

SPECIAL USE AIRSPACE

R-352

R-Restricted
P-Prohibited
W-Warning
A-Alert

AERODROMES

- Civil
- Joint Civil-Military
- Military
- Heliport

Entry facility/fix identified by name and symbol only.
All radials/bearings are magnetic
All mileages are nautical
All altitudes in feet–MSL
MEA – Minimum Enroute Altitude
MOCA – Minimum Obstruction Clearance Altitude

AIRCRAFT APPROACH CATEGORIES

Minimums are specified for the various aircraft speed/weight combinations. Speeds are based upon a value 1.3 times the stalling speed of the aircraft in the landing configuration at maximum certificated gross landing weight. Thus they are COMPUTED values. See FAR 97.3 (b). An aircraft can fit into only one category, that being the highest category in which it meets either specification. For example, a 30,000 pound aircraft landing weight combined with a computed approach speed of 130 knots would place the aircraft in Category C. If it is necessary, however, to maneuver at speeds in excess of the upper limit of the speed range for each category, the minimum for the next higher approach category should be used. For example, a B-727-100 which falls in Category C, but is circling to land at a speed in excess of 140 knots, should use the approach category "D" minimum when circling to land. See following category limits.

Approach Category	Speed/Weight

A : Speed less than 91 knots; weight less than 30,001 pounds.

B : Speed 91 knots or more but less than 121 knots; weight 30,001 pounds or more but less than 60,001 pounds.

C : Speed 121 knots or more but less than 141 knots; weight 60,001 pounds or more but less than 150,001 pounds.

D : Speed 141 knots or more but less than 166 knots; weight 150,001 pounds or more.

E : Speed 166 knots or more; any weight.

RVR/Meteorological Visibility Comparable Values

The following table shall be used for converting RVR to meteorological visibility when RVR is inoperative.

RVR (feet)	Visibility (statute miles)
1600	1/4
2400	1/2
3200	5/8
4000	3/4
4500	7/8
5000	1
6000	1 1/4

Instrument Approach Procedures (Charts)

INOPERATIVE COMPONENTS OR VISUAL AIDS TABLE

Civil Pilots see FAR 91.117(c)

Landing minimums published on instrument approach procedure charts are based upon full operation of all components and visual aids associated with the particular instrument approach chart being used. Higher minimums are required with inoperative components or visual aids as indicated below. If more than one component is inoperative, each minimum is raised to the highest minimum required by any single component that is inoperative. ILS glide slope inoperative minimums are published on instrument approach charts as localizer minimums. This table may be amended by notes on the approach chart. Such notes apply only to the particular approach category(ies) as stated. See legend page for description of components indicated below.

(1) ILS, MLS, and PAR

Inoperative Component or Aid	Approach Category	Increase DH	Increase Visibility
MM*	ABC	50 feet	None
MM*	D	50 feet	¼ mile
ALSF 1 & 2, MALSR, & SSALR	ABCD	None	¼ mile

*Not applicable to PAR

(2) ILS with visibility minimum of 1,800 or 2,000 RVR.

MM	ABC	50 feet	To 2400 RVR
MM	D	50 feet	To 4000 RVR
ALSF 1 & 2, MALSR, & SSALR	ABCD	None	To 4000 RVR
TDZL, RCLS	ABCD	None	To 2400 RVR
RVR	ABCD	None	To ½ mile

(3) VOR, VOR/DME, VORTAC, VOR (TAC), VOR/DME (TAC), LOC, LOC/DME, LDA, LDA/DME, SDF, SDF/DME, RNAV, and ASR

Inoperative Visual Aid	Approach Category	Increase MDA	Increase Visibility
ALSF 1 & 2, MALSR, & SSALR	ABCD	None	½ mile
SSALS, MALS & ODALS	ABC	None	¼ mile

(4) NDB

ALSF 1 & 2, MALSR, & SSALR	C	None	½ mile
	ABD	None	¼ mile
MALS, SSALS, ODALS	ABC	None	¼ mile

UNITED STATES GOVERNMENT
FLIGHT INFORMATION PUBLICATION
ENROUTE HIGH ALTITUDE - U.S.

For use at and above 18,000' MSL

L E G E N D

AIR TRAFFIC SERVICES AND AIRSPACE INFORMATION

ROUTE DATA

VHF/UHF Data is depicted in BLUE; LF/MF Data is depicted in BROWN

- Jet Route
- Oceanic Route
- Substitute Route Structure — All relative and supporting data shown in brown
- (Via or by-passing temporarily shutdown navigational aids). See NOTAMS or appropriate publications for specific information.
- Unusable Route Segment
- Military IFR Route
- Flight Planning Route
- Jet Route Identification
- Preferred Single Direction Jet Route
- Canadian High Level Airway Identification
- A19 ROUTE — Oceanic Route Identification
- AR 1 — Atlantic Route Identification
- 115.9 NAM — Facility Locator used with Radial Line in the formation of a Reporting point
- 275 ANM — Facility Locator used with Bearing Line in the formation of a Reporting Point
- 082 — Radial Outbound from a VHF/UHF Navigational Aid
- 279 — Bearing Inbound to a LF/MF Navigational Aid
- 123 / 146 — Total Mileage between Compulsory Reporting Points and/or Radio Aids
- 23 / 45 — Mileage between other Reporting Points, Radio Aids, and/or Mileage Breakdown
- 42 / 26 — VOR Changeover Point Giving mileage to Radio Aids (Not shown when less than 5 NM from the mid point in either direction

- Mileage Breakdown
- Denotes DME fix. (Distance same as route mileage)
- 15 — Denotes DME fix (Encircled mileage shown when not otherwise obvious)
- MAA-40000 — MAA (Maximum Authorized Altitude) Shown along Routes when other than 45,000'
- MEA-24000 — MEA (Minimum Enroute Altitude) Shown along Routes when other than 18,000'
- MEA and/or MAA Change at other than Radio Aids to Navigation
- MRA (Minimum Reception Altitude)

REPORTING POINTS

- Compulsory Reporting Point
- Non-Compulsory Reporting Point
- Offset Arrows Indicate Facility Forming a Reporting Point. Toward LF/MF / Away From VHF/UHF Radio Aid

ALL ALTITUDES ARE MSL UNLESS OTHERWISE STATED.

BOUNDARIES

- Air Route Traffic Control Center (ARTCC)
- Air Defense Identification Zone (ADIZ)
- Flight Information Region (FIR)
- Upper Information Region (UIR)
- Adjoining ADIZ
- Combined FIR and UIR
- Control Area (CTA)
- Upper Control Area (UTA)
- International Boundary (Not shown when coincident with ARTC or FIR)
- Official Time Zone

AIRSPACE INFORMATION

Open area (white) indicates controlled airspace
Shaded area (brown) indicates uncontrolled airspace

Continental Control Area
That airspace within the conterminous United States excluding certain special use airspace areas.

Continental Positive Control Area
That airspace within the continental control area from 18,000 ft MSL to FL 600 within the conterminous United States excluding the Santa Barbara Island, Farallon Island and the portion south of Lat 25°04'00"N

Air Traffic Service Sample

CTA FIR
MIAMI OCEANIC
KZMA

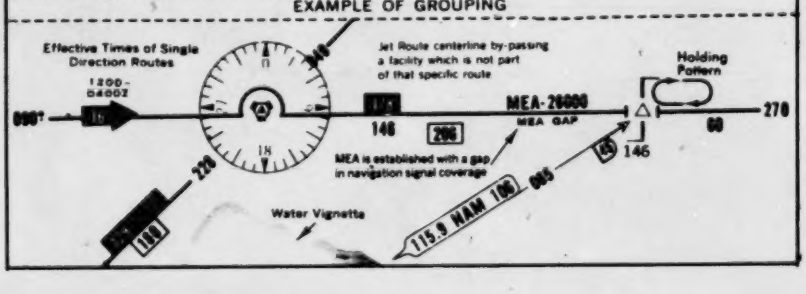
- Additional Control Area Limit

MISCELLANEOUS

- Registration marks Refer to Index on Title Panel
- 1975 Isogonic Line and Value shown each 4°

ALL MILEAGES ARE NAUTICAL EXCEPT AS NOTED
ALL RADIALS AND BEARINGS ARE MAGNETIC
ALL TIME IS GREENWICH MEAN (STANDARD) TIME (GMT)
DAYS ARE LOCAL
‡DURING PERIODS OF DAYLIGHT SAVING TIME (DT) EFFECTIVE HOURS WILL BE ONE HOUR EARLIER THAN SHOWN

EXAMPLE OF GROUPING



UNITED STATES GOVERNMENT
FLIGHT INFORMATION PUBLICATION

ENROUTE HIGH ALTITUDE - U.S.

For use at and above 18,000' MSL

L E G E N D

AERODROMES

Aerodromes shown have a minimum of 5000' hard surfaced runway and have an approved Instrument Approach Procedure published. The DOD FLIP Terminal High Altitude contains only those shown in DARK BLUE.

Civil
Joint Civil-Military
Military

Parentheses around aerodrome name indicates military landing rights not available.

Aerodrome symbol may be displaced for enroute navigational aids.

RADIO AIDS TO NAVIGATION

RADIO AIDS TO NAVIGATION

VHF/UHF Aids are depicted in BLUE
LF/MF Aids are depicted in BROWN

COMPASS ROSE Oriented to Magnetic North

VOR TACAN VORTAC

LF/MF Range with simultaneous Voice Signal Capability (Solid tip in "N" Quadrant)

LF/MF Range without simultaneous Voice Signal Capability

LF/MF Range Course Feathered side indicates "A" Quadrant

LF/MF Non-directional Radiobeacon or Marine Radiobeacon

UHF Non-directional Radiobeacon

Consolan Station

Name Weather Radio — U.S. Weather Station with Voice Communication

IDENTIFICATION BOXES

Abnormal Status Underprint for Affected Data, e.g. TO BE CMSN, SHUT DOWN, MAY BE CMSN, etc.

DME SHUT DOWN
DME
NAME
000.0 MAN

VOR with TACAN compatible DME

NAME
*257 ANM

LF/MF Radio Aid Identification and Frequency

Operates less than continuous or On-Request

Enroute Flight Advisory Service Frequency 122.0. Voice Call e.g., "Los Angeles Flight Watch."

123.65 122.7
NAME
115.9 (L) HAM 186 (L)
060 NM

Underline indicates No Voice on this frequency. TACAN Channels are without Voice but are not underlined.

Heavy line box indicates FSS and radio aid same name.

(FSS freqs available are 255.4, 122.2 selected discrete freqs. and emerg. 243.0 and 121.5). The FSS high altitude VHF discrete freq(s) is shown above the box.

In Canada a heavy line box indicates stations with standard group freq 126.7, 122.2, 122.1R

(L) Frequency Protection Usable range at 18,000' - 40 NM "L" category radio aids located off Jet routes are depicted in screen blue.

Radio Aids to Navigation without Classification are "H" Category

SPECIAL USE AIRSPACE

†P-56
W-123
R-1234 ①
TO 30000 ②
0600-1800Z
MON-FRI ③
IFR ④
ZMA CNTR/FSS ⑤

P - Prohibited Area
R - Restricted Area
W - Warning Area
D - Danger Area (Canada)
A - Alert Area (Canada)
MFA - Military Flying Area (Canada)

SPECIAL USE AIRSPACE WILL INCLUDE:

① Area Identification: In Canada area ident is preceded by the letters CY (CANADA) followed by a number (PROVINCE).

② Effective Altitude when ceiling is not unlimited or floor is above 18,000'. The word "to" (an altitude or flight level) means "to and including" (that altitude or flight level).

③ Operating Time: When continuous no time is shown.
Days: Sunrise to Sunset
Nights: Sunset to Sunrise
Hours: Given in GMT, e.g., 0600-1800Z.
Mon-Fri: Indicates area does not exist on Sat. or Sun.
1 Mar-15 June: Indicates area in use only through dates given
By NOTAM: Area activated by NOTAM
Days are Local

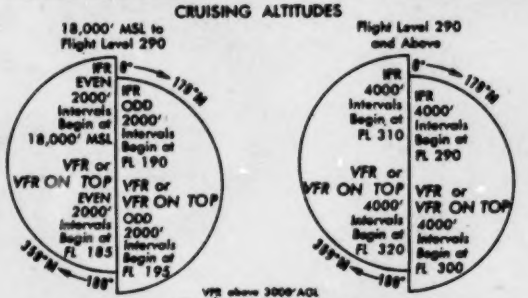
④ Weather Conditions during which the area is in operation. When continuous no weather is shown.
VFR: Used only when VFR Flight can be maintained.
IFR: Used only during IFR Conditions.

⑤ Voice Call of Controlling Agency for enroute clearance through area. No A/C unless indicated.

† Indicates complete information in tabulation on front panel.

A	.-	F	..-.	K	-.-	P	.--.	U	..-	1	.----	6	-....
B	-...	G	--.	L	.-..	Q	--.-	V	...-	2	..---	7	--...
C	-.-.	H	....	M	--	R	.-.	W	.--	3	...--	8	---..
D	-..	I	..	N	-.	S	...	X	-..-	4	....-	9	----.
E	.	J	.---	O	---	T	-	Y	-.--	5	.....	0	-----
								Z	--..				

CRUISING ALTITUDES


18,000' MSL to Flight Level 290
IFR EVEN 2000' Intervals Begin at 18,000' MSL
VFR or VFR ON TOP EVEN 2000' Intervals Begin at FL 185
0°
178°M
IFR ODD 2000' Intervals Begin at FL 190
VFR or VFR ON TOP ODD 2000' Intervals Begin at FL 195
358°M
188°
Flight Level 290 and Above
IFR 4000' Intervals Begin at FL 310
VFR or VFR ON TOP 4000' Intervals Begin at FL 320
IFR 4000' Intervals Begin at FL 290
VFR or VFR ON TOP 4000' Intervals Begin at FL 300

VFR above 3000' AGL
IFR - Outside controlled airspace
(IFR within controlled airspace as assigned by ARC
All courses are magnetic

NO VFR FLIGHTS WITHIN POSITIVE CONTROL AREA

UNITED STATES GOVERNMENT
FLIGHT INFORMATION PUBLICATION

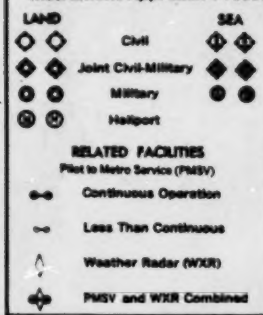
ENROUTE LOW ALTITUDE – U. S.

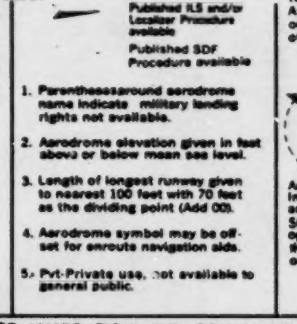
For use up to but not including 18,000' MSL

L E G E N D

AERODROMES

Aerodromes/Seadromes shown in BLUE have an approved Low Altitude Instrument Approach Procedure published. Those shown in DARK BLUE have an approved DOD Low Altitude Instrument Approach Procedure and/or approved DOD RADAR MINIMA published in DOD FLIPS. Aerodromes/Seadromes shown in BROWN do not have a published Instrument Approach Procedure.




Published ILS and/or Localizer Procedure available
Published SDF Procedure available
1. Parentheses around aerodrome name indicate military landing rights not available.
2. Aerodrome elevation given in feet above or below mean sea level.
3. Length of longest runway given to nearest 100 feet with 70 feet as the dividing point (Add 00).
4. Aerodrome symbol may be offset for enroute navigation aids.
5. Pvt-Private use, not available to general public.

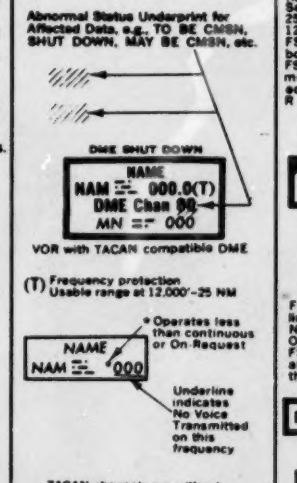
RADIO AIDS TO NAVIGATION AND COMMUNICATION BOXES

RADIO AIDS TO NAVIGATION

VHF/UHF Aids are depicted in BLUE
LF/MF Aids are depicted in BROWN

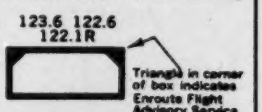
COMPASS ROSE
Oriented to Magnetic North
Size of Compass Rose has no significance. Smaller sizes are used in congested areas.

RADIO AIDS TO NAVIGATION DATA BOXES

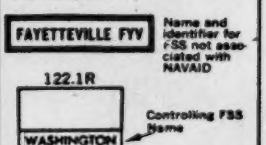

Abnormal Status Underprint for Affected Data, e.g., TO BE CMSN, SHUT DOWN, MAY BE CMSN, etc.
DME SHUT DOWN
NAME
NAM 000.0(T)
DME Chan 00
MN 000
VOR with TACAN compatible DME
(T) Frequency protection
Usable range at 12,000'-25 NM
* Operates less than continuous or On-Request
NAME
NAM 000
Underline indicates No Voice Transmitted on this frequency
TACAN channels are without voice but are not underlined
Norfolk Weather Radio
U.S. Weather Station with Voice Communication
IDENT 000
Commercial Broadcast Station

AIR/GROUND COMMUNICATION BOXES

HEAVY LINE BOXES indicate Flight Service Station (FSS). Frequencies 255.4, 122.2, and emerg. 243.0 and 121.5 are normally available at all FSS's and are not shown above boxes. All other freqs available at FSS's are shown. Frequencies transmit and receive except those followed by R or T:
R – receive only T – transmit only


123.6 122.6
122.1R
Triangle in corner of box indicates Enroute Flight Advisory Service Frequency 122.0. Voice Call e.g., "Los Angeles Flight Watch."

Frequencies positioned above thin line NAVAID boxes are remoted to the NAVAID site.
Other frequencies at the controlling FSS named are available, however, altitude and terrain may determine their reception.



Thin line box, without frequencies and Controlling FSS name indicates no FSS frequencies available.

⊙ Flight Service Station (FSS)
Remote Communications Outlet (RCO)
Limited Remote Communications Outlet (LRCO)

In Canada a heavy line box indicates Aeradio. All available frequencies are shown.

AIR TRAFFIC SERVICES AND AIRSPACE INFORMATION

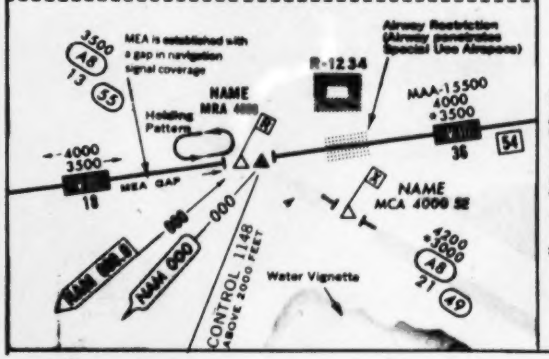
AIRWAY AND ROUTE DATA

VHF/UHF Data is depicted in BLUE; LF/MF depicted in BROWN

- VOR Airway and Identification
- Airway and Identification
- Uncontrolled Airway
- Bahama Route and Identification
- Bahama Route and Identification
- Atlantic Route Identification
- Oceanic and Identification
- Military IFR Route
- Flight Planning Route
- Substitute Route Structure (See NOTAMS for facility outages)
- All relative and supporting data shown in brown
- Unusable or closed segment
- Preferred Single Direction Airway
- Facility Locator used with Radial Line in the formation of a Reporting Point.
- Facility Locator used with Bearing Line in the formation of a Reporting Point.

- Radial Outbound from a UHF/VHF Radio Aid
- Bearing Inbound to a LF/MF Radio Aid
- Total Mileage between Compulsory Reporting Points and/or Radio Aids
- Mileage between other Reporting Points, Radio Aids, and/or Mileage Breakdown
- VOR Changeover Point Giving mileage to Radio Aids (Not shown at mid-point locations)
- Mileage breakdown
- Denotes DME fix (Distance same as route mileage)
- Denotes DME fix (Encircled mileage shown when not otherwise obvious
- MAA (Maximum Authorized Altitude
- MEA (Minimum Enroute Altitude
- MOCA (Minimum Obstruction Clearance Altitude)
- Canada only-Direction of Flight indicator. (Shown when exception to Cruising Alt Diagram.
- MEA, MAA and/or MOCA Change at other than Radio Aids to Navigation
- MRA (Minimum Reception Altitude)
- MCA (Minimum Crossing Altitude)

EXAMPLE OF GROUPING



REPORTING POINTS

- Compulsory Reporting Point
- Non-Compulsory Reporting Point
- Offset Arrows Indicate Facility Forming a Reporting Point. Toward LF/MF, Away from VHF/UHF

BOUNDARIES

- Altimeter Setting Change
- Altimeter Setting Change when not otherwise defined
- Air Route Traffic Control Center (ARTCC)
- NAME Name 134.3 269.5 ARTCC Remoted Sites with Discrete VHF and UHF Freqs.
- Flight Information Region (FIR)
- Air Defense Identification Zone (ADIZ)
- Combined FIR and ADIZ
- Control Area (CTA)
- Control Zone
- Canadian Positive Control Zone
- Control Zones within which fixed-wing special VFR flight is prohibited
- Intl Boundary (Omitted when coincident with ARTCC or FIR)
- Area of Enlargement (Contains only data for through flights). See Area Charts for complete data
- Official Time Zone

AIRSPACE INFORMATION

Open area (white) indicates controlled airspace.
Shaded area (brown) indicates uncontrolled airspace up to 14,500'.
THE BASE OF THE CONTINENTAL CONTROL AREA IS 14,500 FT MSL, EXCLUDING THE AIRSPACE LESS THAN 1,500 FT ABOVE THE TERRAIN AND CERTAIN SPECIAL USE AIRSPACE AREAS.

MISCELLANEOUS

- 1975 Isogonic Line and Value
- ALL MILEAGES ARE NAUTICAL EXCEPT AS NOTED
- ALL RADIALS AND BEARINGS ARE MAGNETIC
- ALL ALTITUDES ARE MSL UNLESS OTHERWISE STATED.
- ALL TIME IS GREENWICH MEAN (STANDARD) TIME (GMT)
- DAYS ARE LOCAL
- ‡ DURING PERIODS OF DAYLIGHT SAVING TIME (DT) EFFECTIVE HOURS WILL BE ONE HOUR EARLIER THAN SHOWN. ALL STATES OBSERVE DT EXCEPT ARIZONA AND THAT PORTION OF INDIANA IN THE EASTERN TIME ZONE.

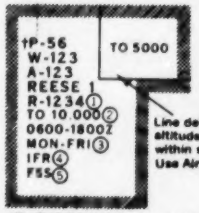
UNITED STATES GOVERNMENT FLIGHT INFORMATION PUBLICATION

ENROUTE LOW ALTITUDE – U. S.

For use up to but not including 18,000' MSL

L E G E N D

SPECIAL USE AIRSPACE



P - Prohibited Area
R - Restricted Area
W - Warning Area
D - Danger Area (Canada)
A - Alert Area

MOA-Military Operations Area in BROWN

SPECIAL USE AIRSPACE WILL INCLUDE:

① Area Identification: In Canada area ident is preceded by the letters CY (CANADA) followed by a number (PROVINCE).

② Effective Altitude ceilings are shown up to but not including 18,000'. When the airspace encompasses all altitudes in the low altitude structure, no altitude will be shown. The word "to" (an altitude) means "to and including" (that altitude).

③ Operating Time: When continuous no time is shown.
Days: Sunrise to Sunset
Nights: Sunset to Sunrise
Hours: Given in GMT, e.g., 0600-1300Z.
Mon-Fri: Indicates area does not exist on Sat. or Sun.
1 Mar-15 June: Indicates area in use only through dates given.
By NOTAM: Area activated by NOTAM. Days are local

④ Weather Conditions during which the area is in operation. When continuous no weather is shown.
VFR: Used only during VFR conditions.
IFR: Used only during IFR conditions.

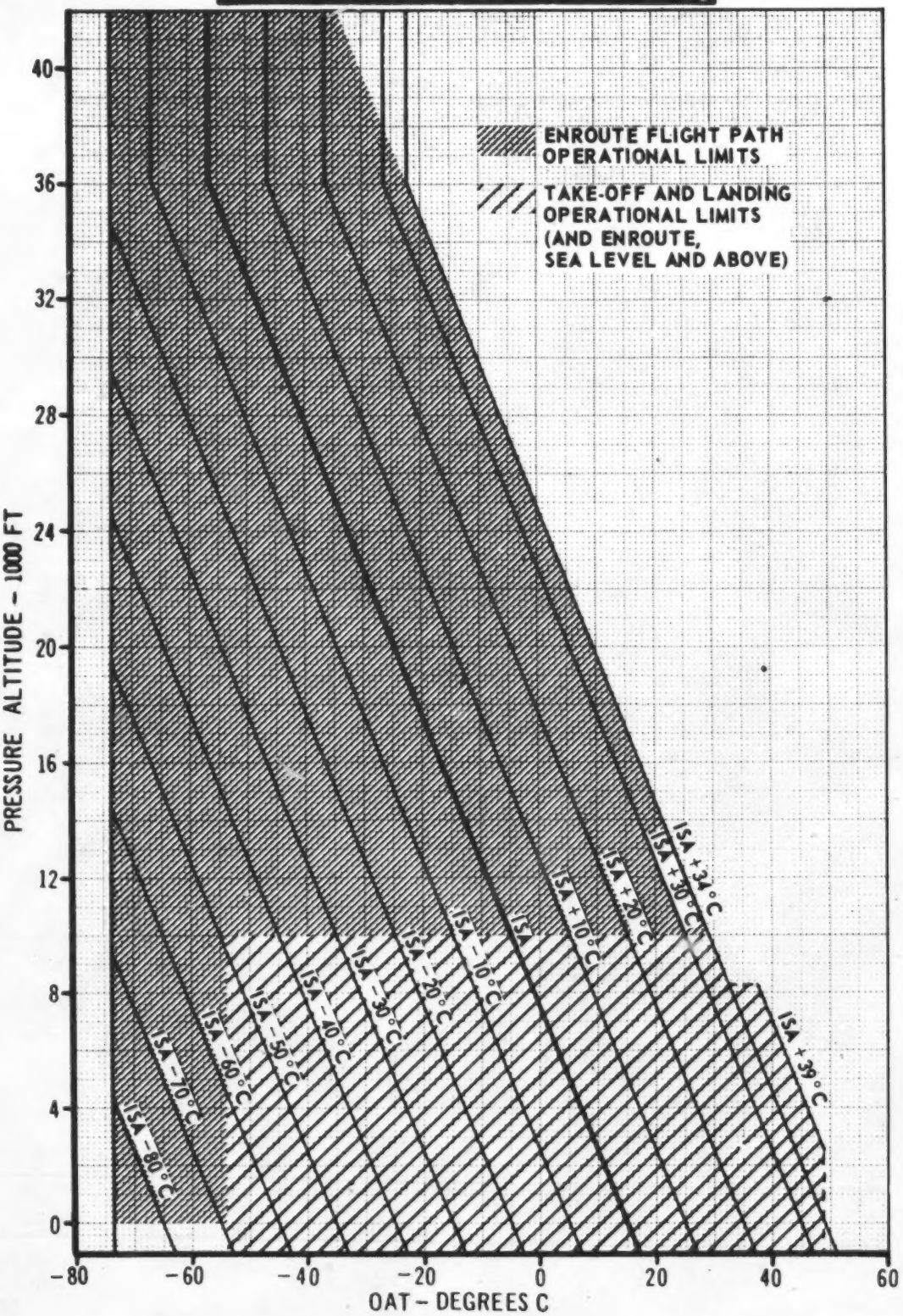
⑤ Voice Call of controlling Agency for enroute clearance through area. No A/G unless indicated.

† Indicates complete information in tabulation on front panel.

CRUISING ALTITUDES - U. S.

VFR above 3000' AGL
IFR* - Outside controlled airspace
IFR within controlled airspace as assigned by ATC
All courses are magnetic

RELATION OF TEMPERATURE TO ISA



PIREP

(U)UA→ /OV→ FL

MSG TYPE LOCATION OF PHENOMENA 3-LTR IDENT RADIAL DISTANCE TIME (Z) FLT LVL

/TP→ /SK→

TYPE AIRCRAFT SKY COVER BASE AMOUNT TOP

/TA→ /WV→

TEMPERATURE-CELSIUS WIND-DIRECTION SPEED

/TB→ /IC→

TURBULENCE-INTENSITY TYPE* ALTITIDE** ICING-INTENSITY TYPE ALTITUDE**

/RM→

REMARKS (MOST HAZARDOUS ELEMENT REPORTED FIRST)

LEGEND: →= SPACE SYMBOL *=ONLY FOR CAT **=ONLY IF DIFFERENT FROM FL

TURBULENCE REPORTING CRITERIA TABLE

Intensity	*Aircraft Reaction*	*Reaction Inside Aircraft*
LIGHT	Turbulence that momentarily causes slight, erratic changes in altitude and/or attitude (pitch, roll, yaw). Report as *Light Turbulence*:* or Turbulence that causes slight, rapid and somewhat rhythmic bumpiness without appreciable changes in altitude or attitude. Report as *Light Chop*.	Occupants may feel a slight strain against seat belts or shoulder straps. Unsecured objects may be displaced slightly. Food service may be conducted and little or no difficulty is encountered in walking.
MODERATE	Turbulence that is similar to Light Turbulence but of greater intensity. Changes in altitude and/or attitude occur but the aircraft remains in positive control at all times. It usually causes variations in indicated airspeed. Report as *Moderate Turbulence*:* or Turbulence that is similar to Light Chop but of greater intensity. It causes rapid bumps or jolts without appreciable changes in aircraft altitude or attitude. Report as *Moderate Chop*.	Occupants feel definite strains against seat belts or shoulder straps. Unsecured objects are dislodged. Food service and walking are difficult.
SEVERE	Turbulence that causes large, abrupt changes in altitude and/or attitude. It usualy causes large variations in indicated airspeed. Aircraft may be momentarily out of control. Report as *Severe Turbulence*.*	Occupants are forced violently against seat belts or shoulder straps. Unsecured objects are tossed about. Food service and walking are impossible.
EXTREME	Turbulence in which the aircraft is violently tossed about and is practically impossible to control. It may cause structural damage. Report as *Extreme Turbulence*.*	

* High level turbulence (normally above 15,000 feet ASL) not associated with cumuliform cloudiness, including thunderstorms, should be reported as CAT (clear air turbulence) preceded by the appropriate intensity, or light or moderate chop.

INTENSITY	ICE ACCUMULATION
Trace	Ice becomes perceptible. Rate of accumulation slightly greater than rate of sublimation. It is not hazardous even though deicing/anti-icing equipment is not utilised, unless encountered for an extended period of time (over 1 hour).
Light	The rate of accumulation may create a problem if flight is prolonged in this environment (over 1 hour). Occasional use of deicing/anti-icing equipment removes/prevents accumulation. It does not present a problem if the deicing/anti-icing equipment is used.
Moderate	The rate of accumulation is such that even short encounters become potentially hazardous and use of deicing/anti-icing equipment or diversion is necessary.
Severe	The rate of accumulation is such that deicing/anti-icing equipment fails to reduce or control the hazard. Immediate diversion is necessary.

Pilot Report: Aircraft Identification, Location, Time (GMT), Intensity of Type,* Altitude/FL, Aircraft Type, IAS.

FORECAST WINDS AND TEMPERATURES ALOFT (FD)

Plotted	*Interpretation*
12 6	12° C, wind 060° at 5 knots
03 6	3° C, wind 160° at 25 knots
6 -09	−9° C, wind 260° at 50 knots
6 -47	−47° C, wind 360° at 115 knots
-11 9 9	−11° C, wind calm (light variable)

KEY TO AVIATION WEATHER REPORTS . . . . . .

LOCATION IDENTIFIER AND TYPE OF REPORT*	SKY AND CEILING	VISIBILITY WEATHER AND OBSTRUCTION TO VISION	SEA-LEVEL PRESSURE	TEMPERATURE AND DEW POINT	WIND	ALTIMETER SETTING	RUNWAY VISUAL RANGE	CODED PIREPS
MKC	15 SCT M25 OVC	1R-K	132	/58/56	/18Ø7	/993/	RØ4LVR2ØV4Ø	/UA OVC 55

SKY AND CEILING

Sky cover contractions are in ascending order. Figures preceding contractions are heights in hundreds of feet above station. Sky cover contractions are:

CLR Clear: Less than Ø.1 sky cover.
SCT Scattered: Ø.1 to Ø.5 sky cover.
BKN Broken: Ø.6 to Ø.9 sky cover.
OVC Overcast: More than Ø.9 sky cover.
– Thin (When prefixed to the above symbols.)
–X Partial obscuration: Ø.1 to less than 1.Ø sky hidden by precipitation or obstruction to vision (bases at surface).
X Obscuration: 1 Ø sky hidden by precipitation or obstruction to vision (bases at surface).

Letter preceding height of layer identifies ceiling layer and indicates how ceiling height was obtained. Thus:

E	Estimated height	V	Immediately following numerical value, indicates a variable ceiling.
M	Measured		
W	Indefinite		

VISIBILITY

Reported in statute miles and fractions. (V=Variable)

WEATHER AND OBSTRUCTION TO VISION SYMBOLS

A	Hail	IC	Ice crystals	S	Snow
BD	Blowing dust	IF	Ice fog	SG	Snow grains
BN	Blowing sand	IP	Ice pellets	SP	Snow pellets
BS	Blowing snow	IPW	Ice pellet showers	SW	Snow showers
D	Dust	K	Smoke	T	Thunderstorms
F	Fog	L	Drizzle	T+	Severe thunderstorm
GF	Ground fog	R	Rain	ZL	Freezing drizzle
H	Haze	RW	Rain showers	ZR	Freezing rain

Precipitation intensities are indicated thus: – Light; (no sign) Moderate; + Heavy

WIND

Direction in tens of degrees from true north, speed in knots. ØØØØ indicates calm. G indicates gusty. Peak speed of gusts follows G or Q when gusts or squall are reported. The contraction WSHFT followed by GMT time group in remarks indicates windshift and its time of occurrence. (Knots X 1.15=statute mi/hr.)

EXAMPLES: 3627=36Ø Degrees, 27 knots; 3627G40=36Ø Degrees, 27 knots, peak speed in gusts 4Ø knots.

ALTIMETER SETTING

The first figure of the actual altimeter setting is always omitted from the report.

RUNWAY VISUAL RANGE (RVR)

RVR is reported from some stations. Extreme values during 10 minutes prior to observation are given in hundreds of feet. Runway identification precedes RVR report.

CODED PIREPS

Pilot reports of clouds not visible from ground are coded with ASL height data preceding and/or following sky cover contraction to indicate cloud bases and/or tops, respectively. UA precedes all PIREPS.

DECODED REPORT

Kansas City: Record observation, 15ØØ feet scattered clouds, measured ceiling 25ØØ feet overcast, visibility 1 mile, light rain, smoke, sea-level pressure 1013.2 millibars, temperature 58°F, dewpoint 56°F, wind 18Ø°, 7 knots, altimeter setting 29.93 inches. Runway Ø4 left, visual range 2ØØØ feet variable to 4ØØØ feet. Pilot reports top of overcast 55ØØ feet.

*TYPE OF REPORT

The omission of type-of-report data identifies a scheduled record observation for the hour specified in the sequence heading. An out-of-sequence, special observation is identified by the letters "SP" following station identification and a 24-hour clock time group, e.g., "PIT SP ØØ15 –X M1 OVC." A special report indicates a significant change in one or more elements.

KEY TO AVIATION WEATHER FORECASTS . . . .

TERMINAL FORECASTS contain information for specific airports on expected ceiling, cloud heights, cloud amounts, visibility, weather and obstructions to vision and surface wind. They are issued 3 times/day and are valid for 24 hours. The last six hours of each forecast are covered by a categorical statement indicating whether VFR, MVFR, IFR or LIFR conditions are expected. Terminal forecasts will be written in the following form:

CEILING: Identified by the letter "C"
CLOUD HEIGHTS: In hundreds of feet above the station (ground)
CLOUD LAYERS: Stated in ascending order of height
VISIBILITY: In statute miles but omitted if over 6 miles
WEATHER AND OBSTRUCTION TO VISION: Standard weather and obstruction to vision symbols are used
SURFACE WIND: In tens of degrees and knots; omitted when less than 1Ø

EXAMPLE OF TERMINAL FORECAST

DCA 2212Ø9: DCA Forecast 22nd day of month—valid time 12Z–09Z.
1Ø SCT C18 BKN 5SW– 3415G25 OCNL C8 X ½SW: Scattered clouds at 1ØØØ feet, ceiling 18ØØ feet broken, visibility 5 miles, light snow showers, surface wind 34Ø degrees 15 knots Gusts to 25 knots, occasional ceiling 8 hundred feet sky obscured, visibility ½ mile in moderate snow showers.
12Z C5Ø BKN 3312G22: At 12Z becoming ceiling 5ØØØ feet broken, surface wind 33Ø degrees 12 knots Gusts to 22.
Ø4Z MVFR CIG: Last 6 hours of FT after Ø4Z marginal VFR due to ceiling.

AREA FORECASTS are 18-hour aviation forecasts plus a 12-hour categorical outlook prepared 2 times/day giving general descriptions of cloud cover, weather and frontal conditions for an area the size of several states. Heights of cloud tops, and icing are referenced ABOVE SEA LEVEL (ASL); ceiling heights, ABOVE GROUND LEVEL (AGL); bases of cloud layers are ASL unless indicated. Each SIGMET or AIRMET affecting an FA area will also serve to amend the Area Forecast.

SIGMET or AIRMET messages warn airmen in flight of potentially hazardous weather such as squall lines, thunderstorms, fog, icing, and turbulence. SIGMET concerns severe and extreme conditions of importance to all aircraft. AIRMET concerns less severe conditions which may be hazardous to some aircraft or to relatively inexperienced pilots. Both are broadcast by FAA on NAVAID voice channels.

WINDS AND TEMPERATURES ALOFT (FD) FORECASTS are 12-hour forecasts of wind direction (nearest 10° true N) and speed (knots) for selected flight levels. Temperatures aloft (°C) are included for all but the 3ØØØ-foot level.

EXAMPLES OF WINDS AND TEMPERATURES ALOFT (FD) FORECASTS:

FD WBC 121745
BASED ON 121200Z DATA
VALID 130000Z FOR USE 1800-0300Z. TEMPS NEG ABV 24000

FT	3000	6000	9000	12000	18000	24000	30000	34000	39000
BOS	3127	3425-07	3420-11	3421-16	3516-27	3512-38	311649	292451	283451
JFK	3026	3327-08	3324-12	3322-16	3120-27	2923-38	284248	285150	285749

At 6000 feet ASL over JFK wind from 330° at 27 knots and temperature minus 8°C

TWEB (CONTINUOUS TRANSCRIBED WEATHER BROADCAST)—Individual route forecasts covering a 25 nautical mile zone either side of the route. By requesting a specific route number, detailed en route weather for a 12 or 18-hour period (depending on forecast issuance) plus a synopsis can be obtained.

PILOTS . . . report in-flight weather to nearest FSS. The latest surface weather reports are available by phone at the nearest pilot weather briefing office by calling at H+10.

WEATHER CHART SYMBOLS

THE WEATHER DEPICTION CHART

TOTAL SKY COVER

- Clear
- Scattered
- Broken, or thin broken
- Overcast, with breaks
- Overcast
- Obscured

OTHER

- Clouds Topping Ridges

WEATHER AND OBSTRUCTIONS TO VISION

- Hail
- Thunderstorm
- Rain
- Snow
- Drizzle
- Haze
- Fog
- Smoke
- Freezing Rain
- Freezing Drizzle
- Rain Shower
- Snow Shower
- Ice Pellets
- Blowing Dust
- Blowing Sand
- Blowing Snow

Figures below the circle are cloud heights in hundreds of feet--either the ceiling; or, if there is no ceiling, the height of the lowest scattered. Figures and symbols to left of circle are visibility and weather or obstructions to vision.

LOW LEVEL PROG CHART

- IFR — CEILING LESS THAN 1000 FT AND/OR VISIBILITY LESS THAN 3 MILES
- MVFR — CEILING 1000-3000 FT INCLUSIVE AND/OR VISIBILITY 3-5 MILES
- VFR — AREAS NOT OUTLINED INDICATE CEILING ABOVE 3000 FEET AND VISIBILITY MORE THAN 5 MILES.
- MODERATE OR GREATER TURBULENCE
- MODERATE TURBULENCE
- SEVERE TURBULENCE
- FREEZING LEVEL SURFACE
- FREEZING LEVEL ABOVE MSL

CONTINUOUS OR INTERMITTENT PRECIPITATION

- LESS THAN .5 AREA COVERAGE
- .5 OR MORE AREA COVERAGE
- INTERMITTENT RAIN
- CONTINUOUS RAIN
- INTERMITTENT SNOW
- CONTINUOUS SNOW
- FREEZING PRECIP
- DRIZZLE

SHOWERS

- LESS THAN .5 AREA COVERAGE
- .5 OR MORE AREA COVERAGE
- RAIN SHOWERS
- SNOW SHOWERS
- THUNDERSTORMS
- 140------TOP IN 100s
- 60------BASE IN 100s

RADAR CHART LEGEND

SYMBOLS COMMON TO ALL PLOTTED RADAR WEATHER REPORTS

WEATHER SYMBOLS

A	Hail	IP	Ice Pellets
R	Rain	L	Drizzle
RW	Rain Showers	ZL	Freezing Drizzle
S	Snow	ZR	Freezing Rain
SW	Snow Showers	T	Thunderstorm

ECHO INTENSITY

-	Weak	X	Intense
(No symbol)	Moderate	XX	Extreme
+	Strong	U	Unknown
++	Very Strong		
Solidus (/)	Separates intensity from intensity trend		

TREND

+	Increasing	NC	No Change
-	Decreasing	NEW	New

Examples of Precipitation Types, Intensity, and Trend

TRW+/-	Thunderstorm, heavy rainshower, decreasing in intensity.
R-/NC	Light rain, no change in intensity.
TRW-/NEW	Thunderstorm, light rain shower, newly developed.
S	Snow (No intensity or characteristic is shown for frozen precipitation.)

MOVEMENT OF ECHOES (Examples)

- Northeast at 15 knots. (Individual Echo)
- East at 25 knots. (Line or area movement)

HEIGHTS OF ECHO BASES AND TOPS

Heights in hundreds of feet MSL are entered above and/or below a line to denote echo tops and bases respectively. Examples are:

450	Average tops are 45,000 feet.
200/80	Tops 20,000 feet; bases 8,000 feet.
350	Top of individual cell, 35,000 feet.
620	Maximum tops, 62,000 feet.
A250	Tops 25,000 feet, reported by aircraft. Absence of a figure below the line indicates that echo base was not reported. Radar detects tops more readily than bases, since precipitation usually reaches the ground. Also, curvature of the earth prohibits the detection of bases of distant precipitation. Information from ATC radar shows tops only when reported by aircraft.

"Boxes" enclosed by dash lines indicate severe weather watch in effect. Refer to latest "WW" for specifics.

SYMBOLS INDICATING NO ECHOES

NE	No echo (equipment operating but no echoes observed).
NA	Observation not available.
OM	Equipment out for maintenance.

SYMBOLS USED WITH WEATHER SURVEILLANCE RADAR

- A line of echoes
- An area of echoes
- Isolated cell
- Strong cell detected by two or more radars
- Strong cell detected by one radar
- Over 9/10 coverage
- 6/10 thru 9/10 coverage
- 1/10 thru 5/10 coverage
- Less than 1/10 coverage

SYMBOLS USED WITH ARTCC ECHO REPORTS

- (Solid line) Echo boundary from ARTCC scopes.
- Line of echoes--possible squall line.

PHYSIOLOGICAL TRAINING

The following articles concerning Hypoxia and Hyperventilation are excerpted from the Physiological Training Manual of the Civil Aeromedical Institute (CAMI). If further information is desired, write the Chief, Physiological Operations and Training Section, AAC–143, Civil Aeromedical Institute, FAA Aeronautical Center, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

Hypoxia

"Hypoxia is probably our most important physiological problem. It can be the most dangerous physical flying problem due to its insidious onset. Hypoxia, therefore, is one of the basic and most vital problems to the aviator. He must completely understand its causes, effects, prevention, and treatment.

Hypoxia can be defined as a lack of sufficient oxygen available to the body cells. The degree of hypoxia depends upon the reduction of the partial pressure of oxygen in the air sacs. This reduction of oxygen pressure becomes apparent in the Physiological Deficient Zone which extends from about 12,000 feet to 50,000 feet. Interference with the supply of oxygen to the cells of the body affects normal processes. The amount of oxygen in the cells may become inadequate due to various conditions.

The most important single characteristic of hypoxia at altitude is that if the aircrew member is engrossed in his duties, he may not notice the effect that hypoxia is having on his body. Each person will experience his individual symptoms of hypoxia; therefore, in order to detect hypoxia, you must know your reactions. Some of the common symptoms to look for are:

1. An increased breathing rate.
2. Light-headed or dizzy sensations.
3. Tingling or warm sensations.
4. Sweating.
5. Loss of vision or reduced vision; sleepiness.
6. Cyanosis (blue coloring of skin, fingernails, and lips).
7. Behavior changes.

Time of Useful Consciousness (T.U.C.) is the time from the onset of hypoxia until deterioration of the individual's effective performance. At altitudes below 30,000 feet this time may differ considerably from the time of total consciousness (the time it takes to "pass out"). Above 35,000 feet the times become closer and eventually coincide for all practical purposes. Various factors will determine T.U.C., some of which are:

1. Altitude. T.U.C. decreases with increasing altitude.
2. Rate of Ascent. In general, the faster the rate, the shorter the T.U.C.
3. Physical Activity. Exercise decreases T.U.C. considerably.
4. Day-to-Day Factors. Physical fitness or ability to tolerate hypoxia will change from day to day; therefore, changing your T.U.C.

The following T.U.C.'s given for various altitudes represent *average* times without supplemental oxygen:

15–18,000 feet	30 minutes or more
22,000 feet	5 to 10 minutes
25,000 feet	3 to 5 minutes
28,000 feet	2½ to 3 minutes
30,000 feet	1 to 2 minutes
35,000 feet	30 to 60 seconds

An immediate realization of your hypoxia symptoms and the obtaining of a proper amount of supplemental oxygen by emergency oxygen equipment procedures are necessary to combat hypoxia.

If oxygen is administered within a matter of 3 to 5 minutes to a person who is unconscious from hypoxia, recovery is usually rapid and complete. However, a hypoxic reaction may be followed by a state of shock during which there is a weak pulse, sweating, low blood pressure, and pooling of blood in dilated capillaries. This condition will require the usual treatment for shock."

Hyperventilation

"The respiratory center of the brain reacts to the amount of carbon dioxide found in the blood stream. When you are in a physically relaxed state, the amount of carbon dioxide in your blood stimulates the respiratory center and your breathing rate is stabilized at about 12 to 16 breaths a minute. When physical activity occurs, the body cells use more oxygen and more carbon dioxide is produced. Excessive carbon dioxide enters the blood and consequently the respiratory center responds to this excess. Breathing increases in depth and rate to remove the excess carbon dioxide. When the excess is removed, the respiratory center changes the breathing back to normal.

The same process is involved when a maximum effort is made to hold the breath. While the breath is being held, the body cells continue to manufacture carbon dioxide which enters the blood. The amount in the blood finally becomes so great that in spite of conscious efforts, the respiratory center overrides it and breathing is resumed.

Hyperventilation, or overbreathing, is a disturbance of respiration that may occur in individuals as a result of physical exertion, emotional tension, or anxiety. It is a condition in which the respiratory rate and depth are abnormally increased. This results in an excessive loss of carbon dioxide from the lungs, lowering the normal carbon dioxide tension of 40 mm. Hg. The most common symptoms are dizziness, hot and cold sensations, tingling of the hands, legs, and feet, tetany, nausea, sleepiness, and, finally, unconsciousness. After becoming unconscious, the breathing rate will be exceedingly low until enough carbon dioxide is produced to stimulate the respiratory center. Hyperventilation is a normal response to hypoxia. However, the excessive breathing does little good. Hyperventilation combined with hypoxia is very serious.

Should symptoms occur which you cannot definitely identify as either hypoxia or hyperventilation, the following steps should be taken:

Check your oxygen equipment immediately and put the regulator on 100% oxygen.

After three or four deep breaths of oxygen, the symptoms should improve markedly, if the condition experienced was hypoxia. (Recovery from hypoxia is extremely rapid.)

If the symptoms persist, you should consciously slow your breathing rate to an abnormally slow rate for 30 to 45 seconds, and then resume your breathing at a normal rate."

DEFINITIONS

Speed of sound—the speed at which sound waves travel through a medium, which is solely a function of temperature.

Mach number—the ratio of the true airspeed to the speed of sound.

$$\text{Mach No. (M)} = \frac{\text{True Airspeed (TAS)}}{\text{Speed of Sound}}$$

Speed of Sound = Mach 1.00

Subsonic—less than the speed of sound.

Transonic—airflow on aircraft components may be partly subsonic and partly supersonic. Mach numbers from 0.75 to 1.20.

Supersonic—definite supersonic airflow on all parts of the aircraft. Mach numbers from 1.20 to 5.00.

Critical Mach number—the highest flight speed possible without supersonic flow over any part of the aircraft.

Mean Aerodynamic Chord (MAC)—is the mean chord of the wing which is established by the manufacturer for engineering design and weight and balance purposes.

Specific range—is the nautical miles of flying distance per pound of fuel. The specific range can be defined by the following relationships:

$$\text{specific range} = \frac{\text{nautical air miles}}{\text{lbs. of fuel}} \quad \text{or} \quad \frac{\text{nautical air miles/hr.}}{\text{lbs. of fuel/hr.}}$$

$$\text{thus, specific range} = \frac{\text{TAS, knots}}{\text{fuel flow, lbs./hr.}}$$

Because of high fuel flow in jet aircraft, specific range is usually expressed as nautical *air* miles per 1,000 lbs. of fuel. (NAM/1,000 lbs.)

Clearway—expressed in terms of a clearway plane, extending from the end of the runway with an upward slope not exceeding 1.25 percent, above which no object nor any terrain protrudes.

Stopway—an area beyond the runway, not less in width than the runway, for use in decelerating the airplane during an aborted takeoff. A stopway can be used for increasing the accelerate-stop distance.

Takeoff Distance—(turbine engine powered airplanes)—The greater of:

1. The horizontal distance from the point of brake release to a point where the airplane attains a height of 35 feet above the takeoff surface, assuming an engine failure at the V_1 speed, or

2. 1.15 times the horizontal distance from the point of brake release to the point where the airplane attains a height of 35 feet above the takeoff surface with all engines operating.

The takeoff distance available, used in entering the chart, is the sum of the runway length plus the actual or maximum allowable clearway length. The length of the clearway used must not be greater than one-half the length of the runway.

Takeoff Run—(turbine engine powered airplanes)—The greater of:

1. The horizontal distance from the point of brake release to a point equidistant between the lift-off point and the point where the airplane attains a height of 35 feet above the takeoff surface, assuming an engine failure at V_1 speed, or

2. 1.15 times the horizontal distance from the point of brake release to a point equidistant between the lift-off point and the point where the airplane attains a height of 35 feet above the takeoff surface with all engines operating.

The takeoff run, used in entering the chart, must not exceed the length of the runway.

Accelerate-Stop Distance—The horizontal distance to accelerate from a standing start to the V_1 speed and thereafter, assuming an engine failure at this speed, to bring the airplane to a full stop. The accelerate-stop distance, used in entering the chart, must not exceed the length of the runway plus the length of the stopway.

Balanced Field Length—The condition where the takeoff distance is equal to the accelerate-stop distance. This distance must not exceed the length of the runway.

Unbalanced Field Length—The condition where the takeoff distance and accelerate-stop distance are not equal.

U. S. DEPARTMENT OF TRANSPORTATION – FEDERAL AVIATION ADMINISTRATION

QUESTION SELECTION SHEET

ATP (AC)–2A

TITLE	TEST NO.
AIRLINE TRANSPORT PILOT – AIRPLANE (AIR CARRIER)	SAMPLE

NAME _____

NOTE: (1) IT IS PERMISSIBLE TO MARK ON THIS SHEET

(2) LEGEND MATERIAL IS IN QUESTION BOOK APPENDIX, pages 171 through 182.

On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number
1	003	21	250	41	541	61	801
2	009	22	272	42	542	62	810
3	016	23	294	43	543	63	830
4	021	24	311	44	544	64	840
5	029	25	324	45	584	65	848
6	036	26	349	46	595	66	853
7	045	27	354	47	606	67	862
8	050	28	364	48	615	68	875
9	063	29	383	49	618	69	879
10	078	30	393	50	625	70	883
11	089	31	412	51	636	71	892
12	101	32	424	52	653	72	894
13	116	33	437	53	661	73	901
14	137	34	448	54	685	74	903
15	150	35	453	55	686	75	913
16	167	36	460	56	687	76	919
17	176	37	469	57	688	77	936
18	192	38	495	58	769	78	946
19	219	39	506	59	783	79	967
20	236	40	513	60	793	80	975

THIS IS A SAMPLE TEST. THIS IS NOT A DUPLICATE OF AN OFFICIAL TEST YOU MIGHT RECEIVE AT THE TESTING CENTER.

0436657

DEPARTMENT OF TRANSPORTATION — FEDERAL AVIATION ADMINISTRATION

AIRMAN WRITTEN TEST APPLICATION

DATE OF TEST (MONTH | DAY | YEAR) | TITLE OF TEST | TEST NO.

PLEASE PRINT ONE LETTER IN EACH SPACE LEAVE A BLANK SPACE AFTER EACH NAME

NAME (LAST, FIRST, MIDDLE) | DATE OF BIRTH (MONTH | DAY | YEAR)

MAILING ADDRESS NO. AND STREET, APT. #, P.O. BOX, OR RURAL ROUTE | DESCRIPTION (HEIGHT | WEIGHT | HAIR | EYES)

CITY, TOWN OR POST OFFICE, AND STATE | ZIP CODE

BIRTHPLACE (City and State, or foreign country) | CITIZENSHIP | SOCIAL SECURITY NO. | IF A SOCIAL SECURITY NUMBER HAS NEVER BEEN ISSUED CHECK THIS BLOCK → ☐

Is this a retest? ☐ No ☐ Yes, date of last test | Have you taken or are you taking an FAA approved course for this test? ☐ No ☐ Yes (If "yes" give details below)

Graduation date | NAME OF SCHOOL | CITY AND STATE

CERTIFICATION: I CERTIFY that all of the statements made in this application are true, complete, and correct to the best of my knowledge and belief and are made in good faith. Signature _____

— DO NOT WRITE IN THIS BLOCK — — FOR USE OF FAA OFFICE ONLY —

Applicant's identity established by

CARD A: CATEGORY | TEST NUMBER | TAKE NO | SECTIONS 1 2 3 4 5 6 7 | EXPIRATION (MONTH | DAY | YEAR)

CARD B: CERTIFICATED SCHOOL NUMBER | MECH EXP DATE BY SECTION 1 2 3 | ID

FIELD OFFICE DESIGNATION

SIGNATURE of FAA Representative

INSTRUCTIONS FOR MARKING THE ANSWER SHEET. Completely darken only one circle for each question. DO NOT USE (X) OR (✓). Use black lead pencil furnished by examiner. To make corrections, open answer sheet so erasure marks will not show on page 2. Then erase incorrect response on page 4. On page 2 (copy) mark the incorrect response with a slash (/). Questions are arranged in VERTICAL sequence as indicated by the arrows.

1 ①②③④	23 ①②③④	45 ①②③④	67 ①②③④	89 ①②③④	111 ①②③④	133 ①②③④
2 ①②③④	24 ①②③④	46 ①②③④	68 ①②③④	90 ①②③④	112 ①②③④	134 ①②③④
3 ①②③④	25 ①②③④	47 ①②③④	69 ①②③④	91 ①②③④	113 ①②③④	135 ①②③④
4 ①②③④	26 ①②③④	48 ①②③④	70 ①②③④	92 ①②③④	114 ①②③④	136 ①②③④
5 ①②③④	27 ①②③④	49 ①②③④	71 ①②③④	93 ①②③④	115 ①②③④	137 ①②③④
6 ①②③④	28 ①②③④	50 ①②③④	72 ①②③④	94 ①②③④	116 ①②③④	138 ①②③④
7 ①②③④	29 ①②③④	51 ①②③④	73 ①②③④	95 ①②③④	117 ①②③④	139 ①②③④
8 ①②③④	30 ①②③④	52 ①②③④	74 ①②③④	96 ①②③④	118 ①②③④	140 ①②③④
9 ①②③④	31 ①②③④	53 ①②③④	75 ①②③④	97 ①②③④	119 ①②③④	141 ①②③④
10 ①②③④	32 ①②③④	54 ①②③④	76 ①②③④	98 ①②③④	120 ①②③④	142 ①②③④
11 ①②③④	33 ①②③④	55 ①②③④	77 ①②③④	99 ①②③④	121 ①②③④	143 ①②③④
12 ①②③④	34 ①②③④	56 ①②③④	78 ①②③④	100 ①②③④	122 ①②③④	144 ①②③④
13 ①②③④	35 ①②③④	57 ①②③④	79 ①②③④	101 ①②③④	123 ①②③④	145 ①②③④
14 ①②③④	36 ①②③④	58 ①②③④	80 ①②③④	102 ①②③④	124 ①②③④	146 ①②③④
15 ①②③④	37 ①②③④	59 ①②③④	81 ①②③④	103 ①②③④	125 ①②③④	147 ①②③④
16 ①②③④	38 ①②③④	60 ①②③④	82 ①②③④	104 ①②③④	126 ①②③④	148 ①②③④
17 ①②③④	39 ①②③④	61 ①②③④	83 ①②③④	105 ①②③④	127 ①②③④	149 ①②③④
18 ①②③④	40 ①②③④	62 ①②③④	84 ①②③④	106 ①②③④	128 ①②③④	150 ①②③④
19 ①②③④	41 ①②③④	63 ①②③④	85 ①②③④	107 ①②③④	129 ①②③④	
20 ①②③④	42 ①②③④	64 ①②③④	86 ①②③④	108 ①②③④	130 ①②③④	
21 ①②③④	43 ①②③④	65 ①②③④	87 ①②③④	109 ①②③④	131 ①②③④	
22 ①②③④	44 ①②③④	66 ①②③④	88 ①②③④	110 ①②③④	132 ①②③④	

* U. S. GOVERNMENT PRINTING OFFICE : 1979 625-709/1394

FLIGHT TIME ANALYSIS

CHECK POINTS		ROUTE	MACH NO.	WIND FACTOR	SPEED-KNOTS		DIST	TIME		FUEL CONSUMPTION (POUNDS)		MISC
FROM	TO	ALTITUDE FLT/LEVEL		TEMPERATURE.	TAS	GRND SPEED	N.M.	LEG	TOTAL	LEG	TOTAL	

ALTERNATE AIRPORT DATA

FLIGHT SUMMARY

TIME	FUEL	
		ENROUTE
		ALTERNATE
		RESERVE
		MISSED APPROACH
		TOTAL

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